SANbox2-8c/16 Switch Management

User's Guide

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TL device support	5.2.4
Logging on to a switch	A.1
Inband enable	Set Config Command
Correct Mem keyword description	Set Setup Command
Post Log, Support keywords	Show Command
Inbyte, Outbyte, Inframe, Outframe keywords	Show Perf Command
Mfg keyword	Show Setup Command

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Section 1
Introduction

This manual describes the switch management tools which include the SANbox® Manager® application (version 1.04) and the Command Line Interface (CLI) for the SANbox2-8c and SANbox2-16 Fibre Channel switches (firmware version 1.4). The SANbox Manager switch management application is the primary focus of this manual which is organized as follows:

- Section 1 describes the intended audience for this manual, related materials, and technical support.
- Section 2 describes how to use SANbox Manager, its menus, and its displays.
- Section 3 describes fabric management tasks.
- Section 5 describes switch management tasks.
- Section 4 describes port and device management tasks.
- Appendix A describes the Command Line Interface.
- Appendix B describes the optional performance monitoring application, Fabric View.

A glossary of terms and an index are also provided.

1.1 Intended Audience

This manual introduces the switch management products and explains their installation and use. It is intended for users responsible for installing and using network management tools.

1.2 Related Materials

Refer to the following manual for switch hardware and installation information:

- *SANbox2-16 Fibre Channel Switch Installation Guide*, publication number 59021-04.
- *SANbox2-8c Fibre Channel Switch Installation Guide*, publication number 59042-01.

1.3 Technical Support

Customers should contact their authorized maintenance provider for technical support of their QLogic switch products. QLogic-direct customers may contact QLogic Technical Support; others will be redirected to their authorized maintenance provider.

Visit the QLogic switch support Web site listed in Contact Information for the latest firmware and software updates.

1.3.1 Availability

QLogic Technical Support is available from 7:00 AM to 7:00 PM Central Standard Time, Monday through Friday, excluding QLogic-observed holidays.

1.3.2 Training

QLogic offers the following technical training courses:

- Switch Certification
- HBA Certification

Each course is available at the training facility in Eden Prairie, MN or at your local facility. All courses include a Fibre Channel overview and sections on installation, maintenance, and topology solutions. Each student receives a set of manuals and a CD-ROM containing course training materials. Upon successful completion of the training, QLogic awards a certificate identifying the student as a Certified SANbox™ or SANblade™ Professional.

1.3.3 Contact Information

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Email: Technical Service Technical Training	 support@qlogic.com tech.training@qlogic.com
Switch Support Web Site:	www.qlogicswitchnet.com

Section 2

Using SANbox Manager

This section describes how to use the SANbox Manager application and its menus. The following topics are covered:

- Installing SANbox Manager
- Starting SANbox Manager
- Exiting SANbox Manager
- Changing the password for the default fabric view file
- Setting SANbox Manager user preferences
- Using online help
- SANbox Manager user interface
- Using the topology display
- Using the faceplate display

2.1 Installing SANbox Manager

The SANbox Manager application requires a management workstation with the following characteristics:

Table 2-1 Management Workstation Requirements

Operating System	■ Windows® NT, 2000, 95/98 ■ Linux® 6.2 Red Hat® ■ Solaris™
Memory	128 MB or more
Disk Space	150 MB per installation
Processor	300 MHz or faster
Hardware	CD-ROM drive, RS-232 serial port, RJ-45 Ethernet port
Internet Browser	Microsoft® Internet Explorer® or Netscape Navigator®

2.1.1
For Windows:

To install the SANbox Manager application on Windows from the SANsurfer Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and Insert the SANsurfer Tool Kit CD into the management workstation CD-ROM drive. If the SANsurfer Tool Kit start page does not open in your default browser, do the following:
   a. Using Windows Explorer, double-click the drive letter which contains the SANsurfer Took Kit CD.
   b. Locate and double-click the **Start_Here.htm** file to open the SANsurfer Tool Kit start page in your default browser.
2. On the SANsurfer Tool Kit start page, choose the **SANbox Switch Software** button.
3. On the SANbox Switch Software page, scroll to the SANbox2-8c/16 (2Gb) Series area.
4. In the Windows column, choose the **SANbox Manager** link to open the File Download window.
5. You have a choice of running the installation file from the CD-ROM or downloading the installation file to your hard drive. Choose one of the following:
   - Open the installation file from the CD-ROM and follow the SANbox Manager installation instructions.
   - Specify a location in which to save the **sansurfer_windows_install.exe** file, and choose the **Save** button. Double-click the saved **sansurfer_windows_install.exe** file and follow the SANbox Manager installation instructions.

2.1.2
For Linux:

To install the SANbox Manager application on Linux from the SANsurfer Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and insert the SANsurfer Tool Kit CD into the management workstation CD-ROM drive. If a file browser window opens showing icons for the contents of the CD-ROM, double-click the **Start_Here.htm** file to open the SANsurfer Tool Kit start page. If a file browser does not open, double-click the CD-ROM icon on the to open the browser. If there is no CD-ROM icon, do the following:
   a. Open an xterm or other terminal window.

b. Mount the CD-ROM. From a shell prompt, enter the following command:

```
mount /mnt/cdrom
```

c. Execute your web browser to view the **Start_Here.htm** document using one of the following commands:

```
$mozilla file:/mnt/cdrom/Start_Here.htm
```

or

```
$netscape file:/mnt/cdrom/Start_Here.htm
```

d. The SANsurfer Tool Kit start page opens in your default browser.

2. On the SANsurfer Tool Kit start page, choose the **SANbox Switch Software** button.
3. On the SANbox Switch Software page, scroll to the SANbox2-8c/16 (2Gb) Series area.
4. In the Linux column, choose the **SANbox Manager** link to open the Save As window.
5. Enter a path name to save the **sansurfer_linux_install.bin** file, and choose the **Save** button.
6. Open a terminal window for the directory in which the **sansurfer_linux_install.bin** file was saved, and enter the following command:

```
chmod +x sansurfer_linux_install.bin
```

7. Press the **Enter** key.
8. Enter the following command:

```
./sansurfer_linux_install.bin
```

9. Press the **Enter** key, and follow the SANbox Manager installation instructions.

2.1.3 For Solaris:

To install the SANbox Manager application on Solaris from the SANsurfer Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and insert the SANsurfer Tool Kit CD into the management workstation CD-ROM drive. If the SANsurfer Tool Kit start page does not open in your default browser, do the following:
   a. Right-click the to open the Workshops Menu.
   b. Point to and select **Files**, then select **File Manager**.

c. In File Manager, double-click the CD-ROM icon, and then double-click the Sansurfer folder.

d. In the Sansurfer folder, double-click the **Start_Here.htm** file to open the SANsurfer Tool Kit start page in your default browser.

2. On the SANsurfer Tool Kit start page, choose the **SANbox Switch Software** button.
3. On the SANbox Switch Software page, scroll to the SANbox2-8c/16 (2Gb) Series area.
4. In the Solaris column, choose the **SANbox Manager** link to open the Save As window.
5. Enter a path name to save the **sansurfer_solaris_install.bin** file and choose the **Save** button.
6. Open a terminal window for the directory in which the **sansurfer_solaris_install.bin** file was saved, and enter the following command:

```
chmod +x sansurfer_solaris_install.bin
```

7. Press the **Enter** key.
8. Enter the following command:

```
./sansurfer_solaris_install.bin
```

9. Press the **Enter** key, and follow the SANbox Manager installation instructions.

Note: If you download SANbox Manager from a server, be sure the downloaded file has execute permission before installing.

2.2 Starting SANbox Manager

To start the SANbox Manager application for the first time, choose one of the following, and press the **Enter** key:

- For a Windows platform, double-click the SANbox Manager shortcut, or select SANbox Manager from Start menu, depending on how you installed the SANbox Manager application.
- For a Linux platform, enter the following on the command line:

```
# /SANbox_Manager/SANbox_Manager
```

- For a Solaris platform, enter the following on the command line:

```
/usr/opt/QLogic_Corporation/SANbox_Manager/SANbox_Manager
```

The SANbox Manager application opens with the display shown in Figure 2-1.

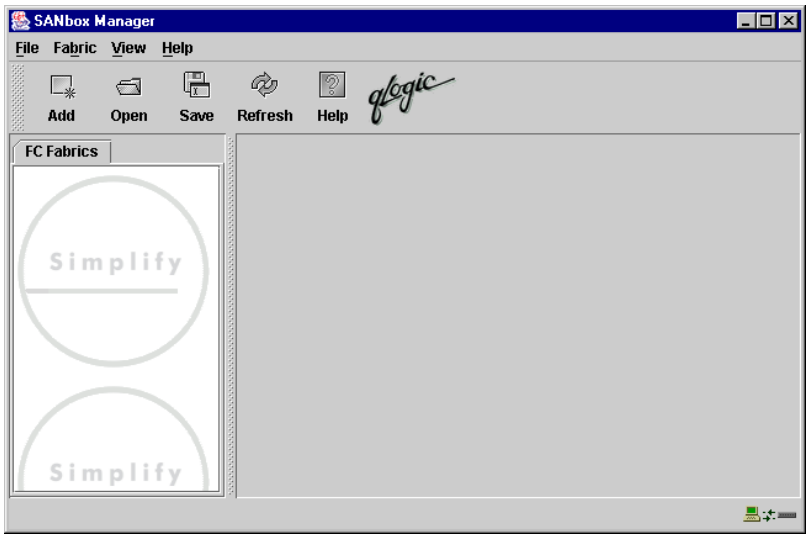


Figure 2-1 SANbox Manager Window

If the default fabric view file exists, the system prompts you to enter the file password as shown in Figure 2-2. Enter the password and choose the **Load View File** button to open the SANbox Manager application and load a previously saved set of fabrics. Otherwise, choose the **Continue Without Loading** button to open an empty fabric view. Choose the **Add** button to open the Add a New Fabric window shown in Figure 2-3.

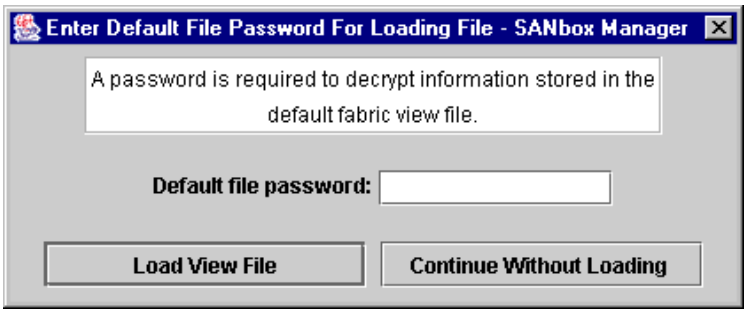

Enter Default File Password For Loading File - SANbox Manager
A password is required to decrypt information stored in the default fabric view file.
Default file password:
Load View File
Continue Without Loading

Figure 2-2 Load Default Fabric View File Window

To start using the SANbox Manager application, do the following to add a fabric:

1. Open the Fabric menu and select **Add Fabric** to open the Add a New Fabric window as shown in Figure 2-3.

Figure 2-3 Add a New Fabric Window

2. Enter a fabric name and the IP address of the switch through which to manage the fabric.
3. Enter an account name and a password. The factory account name is "admin" and the factory password is "password". If security is turned off (default), you are not required to enter an account name or password. This account name is for the switch and is stored in the switch firmware. Refer to the User Command on page A-69 for more information.
4. Choose the **Add Fabric** button.

Note: A switch supports a combined maximum of 15 logins. This includes SANbox Manager inband and out-of-band logins, Telnet out-of-band logins, and SNMP out-of-band logins. Of this 15, there can be a maximum of 10 SANbox Manager logins. Additional logins will be refused.

2.3 Exiting SANbox Manager

When exiting SANbox Manager, the current fabric view is encrypted and saved to the default fabric view file (fc_view.dft). A password is required to encrypt and save the default fabric view file the first time you exit SANbox Manager. When you exit subsequent sessions, SANbox Manager closes and saves the default fabric view file automatically without having to enter a password.

In your next session, SANbox Manager opens the default fabric view file automatically after entering its password. To prevent SANbox Manager from automatically saving the default fabric view file each time you exit SANbox Manager, set the View File Auto Save and Load preferences setting to Disable

(Enable is the default). Refer to "Setting Preferences" on page 2-8 for more information.

To exit a SANbox Manager application session, open the File menu and select **Exit**. The system prompts you to enter a password with which to protect the default fabric view file as shown in Figure 2-4. Choose one of the following:

- Enter a password and choose the **Save View File** button to save the current set of fabrics in the default fabric view file (fc_view.dft) in the working directory.
- Choose the **Exit Without Saving** button to exit the application without saving the current fabrics to the default fabric view file.
- Choose the **Cancel Exit** button to cancel the exit operation.

Enter Default File Password For Saving File - SANbox Manager
A password is required to encrypt information to be stored in a default fabric view file.
Default file password:
Save View File
Exit Without Saving
Cancel Exit

Figure 2-4 Save Current Fabric View Window

If the default fabric view file was saved with a password, the next time you open the SANbox Manager application, you will be prompted for the password in the Load Default Fabric View File window as shown in Figure 2-2. Your fabric opens after entering the password.

2.4 Uninstalling SANbox Manager

A program to uninstall SANbox Manager was installed as part of the SANbox Manager installation process. The Uninstaller Data folder in the Install folder contains the uninstall program (Uninstall SANbox Manager). Also, a shortcut/link to the uninstall program was installed in the installation directory during the SANbox Manager installation process. The default installation directory is /QLogic_Corporation/SANbox_Manager.

To uninstall the SANbox Manager application:

1. Browse for the uninstall program file or the shortcut/link that points to the uninstall program file. The uninstall program shortcut is in the same folder as the program shortcut (Start menu, program group, on, or user specified) that is used to start the SANbox Manager application.

2. Double-click the uninstall program file or shortcut/link, and follow the instructions to uninstall the SANbox Manager application.

Note: For UNIX uninstalls, execute the link to Uninstall_SANbox_Manager. If no links were created during the installation, run: $INSTALL_DIR/UninstallerData/Uninstall_SANbox_Manager. Where INSTALL_DIR is the directory selected for installation.

2.5 Changing Default File Password

To change the password for the default fabric view file, do the following:

1. Open the File menu and select **Change Default File Password** to open the Set New Password window as shown in Figure 2-5.

Set New Password - SANbox Manager
A password is required to encrypt information to be stored in a default fabric view file when you exit the application.
Default file password:
Re-enter password to confirm:
Ok
Cancel

Figure 2-5 Set New Password Window

2. Enter the new password in the Default File Password field.
3. Re-enter the same password in the Re-enter Password to Confirm field.
4. Choose the **OK** button to save the changes.

2.6 Setting Preferences

Using the Preferences settings, you can:

- Change the location of the working directory in which to save files
- Change the location of the browser used to view the online help
- Choose the fabric discovery interval. The fabric discovery interval is how often the SANbox Manager application polls the fabric. Choose 30, 45, or 60 seconds.
- Enable or disable the default view file auto save and load feature. Refer to ”Starting SANbox Manager” on page 2-4 for more information on the default fabric view file.
- Choose the default port view when opening the faceplate display. Refer to ”Monitoring Port Status” on page 5-2 for more information on port views.

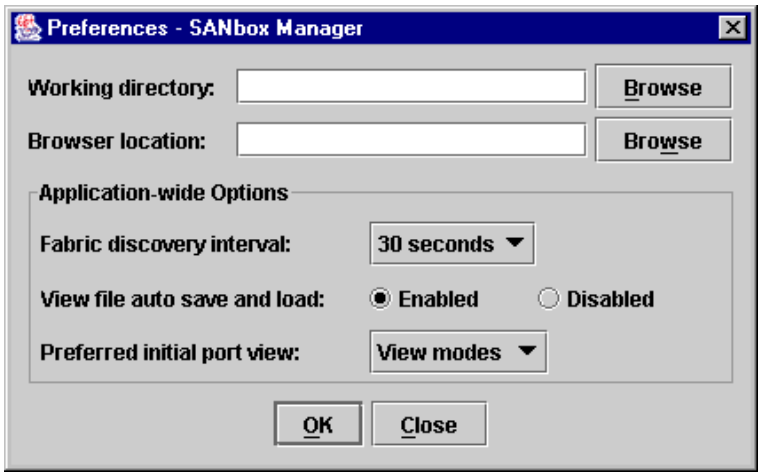


Figure 2-6 Preferences Window

To set user preferences for your SANbox Manager sessions, do the following:

1. Open the File menu, and select **Preferences** to open the Preferences window.
2. Enter or browse for paths to the working directory and browser.
3. In the Application-wide Options area, choose the polling frequency, enable or disable the View File Auto Save and Load feature, and choose the initial port view when entering the faceplate display.
4. Choose the **Apply** button to save the changes.

2.7 Using Online Help

Online help is available for the SANbox Manager application and its functions. The two ways to open the online help file are: open the Help menu and select **Help Topics**, or choose the **Help** button in the tool bar.

2.8 Viewing Software Version and Copyright Information

To view SANbox Manager software version and copyright information, open the Help menu and select **About....**

2.9

SANbox Manager User Interface

The SANbox Manager application uses two basic displays to manage the fabric and individual switches: the topology display and the faceplate display. The topology display shows all switches that are able to communicate and all connections between switches. The faceplate display shows the front of a single switch and its ports. Both displays share some common elements as shown in Figure 2-7.

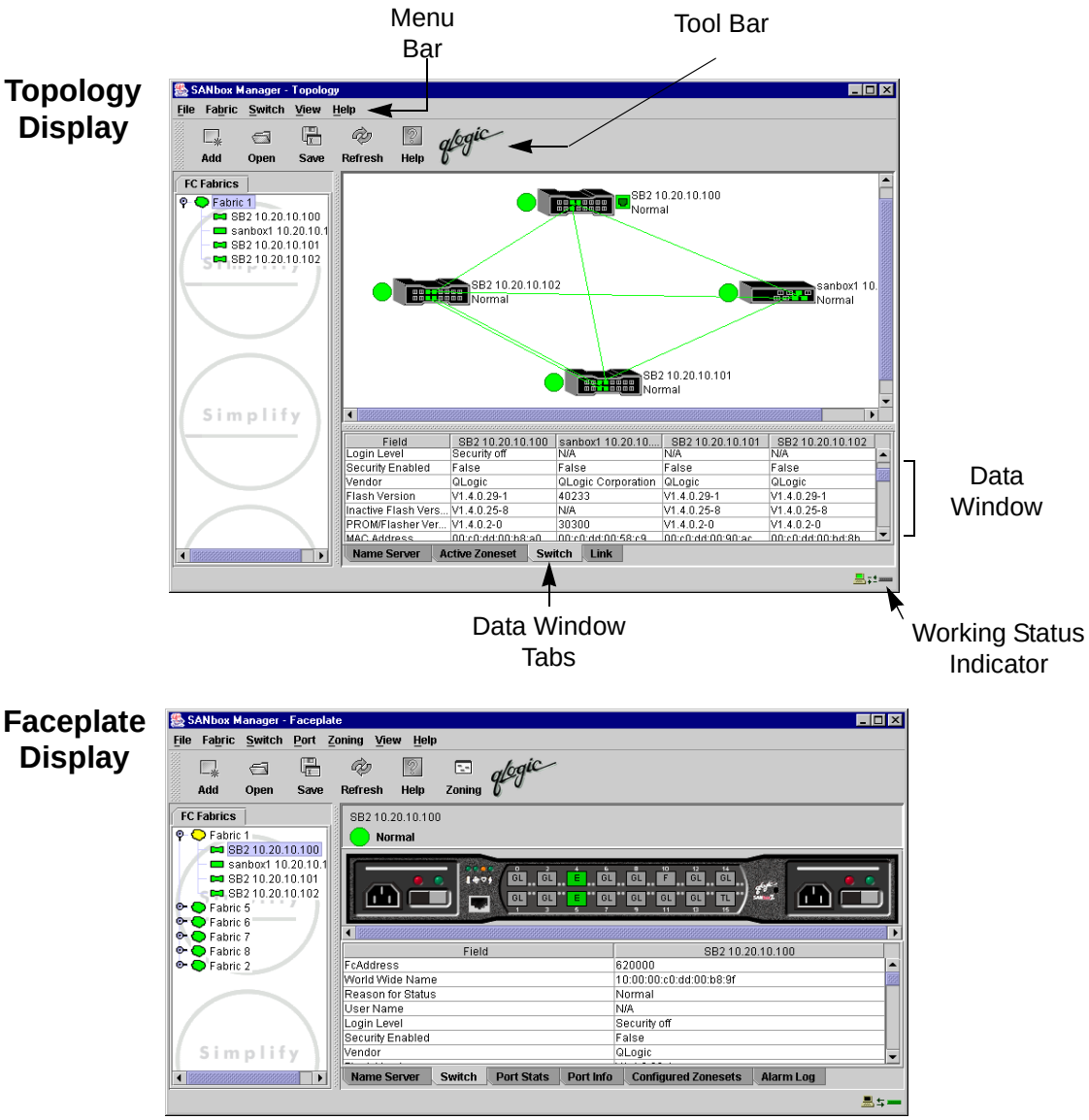


Figure 2-7 SANbox Manager Display Elements

2.9.1
Menu Bar

The Menu Bar presents the SANbox Manager menus as shown in Figure 2-8. The menus and the tasks offered in them vary depending on the display. For example, the Port menu and many of the Switch menu selections, shown in gray, appear only in the faceplate display.

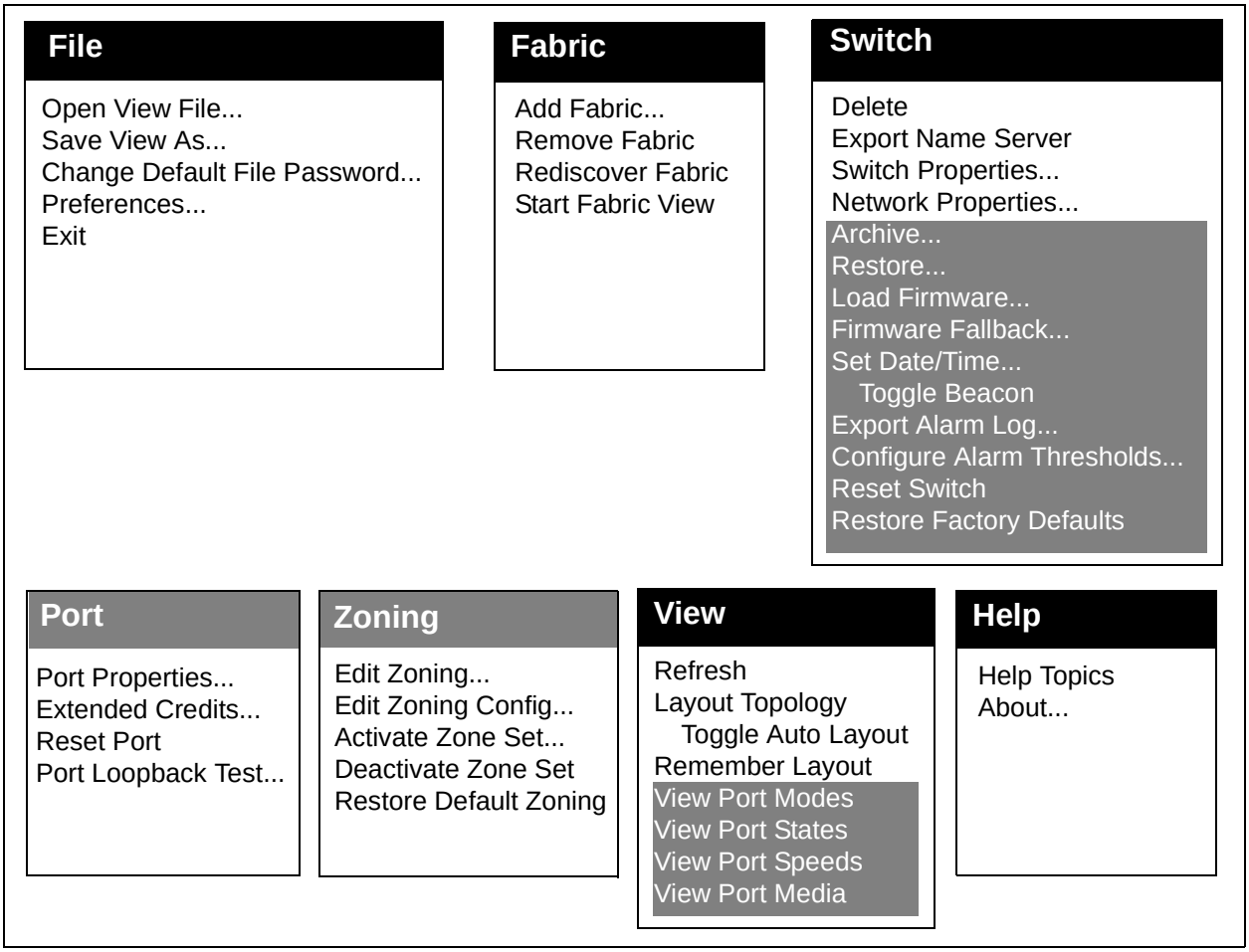


Figure 2-8 SANbox Manager Menu Structure

Some menu selections have shortcut keys as shown in Table 2-2.

Table 2-2 Menu Shortcut Keys

Shortcut Key	Menu Selection
F5 key	View>Refresh
Ctrl+O	File>Open View File

In addition to the menu bar, both the topology and faceplate displays have context sensitive menus that pop up when you click in the graphic window with the right mouse button. Refer to ”Opening the Faceplate Display and Popup Menus” on page 2-16 for more information about these popup menus.

2.9.2 Tool Bar

The Tool Bar consists of a row of graphical buttons that you can use to access SANbox Manager functions as shown in Table 2-3. The tool bar buttons are an alternative method to using the menu bar.

Table 2-3 Tool Bar Buttons

Tool Bar Button	Description
	Add Fabric button - adds a new fabric.
	Open View File button - opens an existing fabric view file.
	Save View As button - saves the current fabric view to a file.
	Refresh button - polls fabric to update topology or faceplate display with current information.
	Help Topics button - opens the online help file.
	Edit Zoning button - opens the Edit Zoning window (available only in faceplate display).

2.9.3
Fabric Tree

The fabric tree lists the managed fabrics and their switches as shown in Figure 2-9. The window width can be adjusted by clicking and dragging the moveable window border. An entry handle located to the left of an entry in the tree indicates that the entry can be expanded. Click this handle or double-click the entry to expand or contract a fabric tree entry. A fabric entry expands to show its member switches.

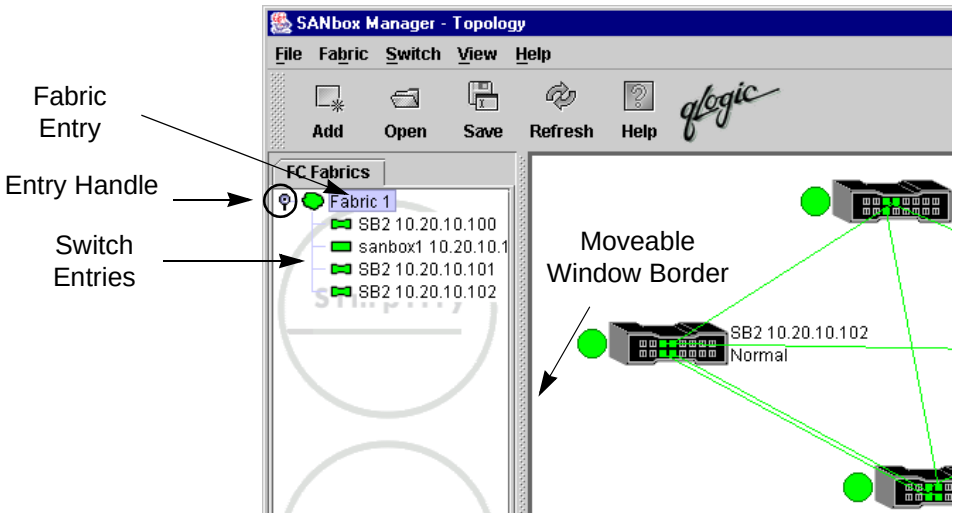


Figure 2-9 Fabric Tree

Each fabric tree entry has a small icon next to it that uses color to indicate operational status.

- A green icon indicates normal operation.
- A red icon indicates a communications failure.
- A blue icon indicates that a switch is unknown, or a switch with security enabled when the fabric management switch has security disabled.
- A yellow icon indicates that a switch is operational with errors.

The fabric tree provides access to the topology and faceplate displays for any fabric or switch.

- To open the topology display from the fabric tree, click a fabric entry.
- To open the faceplate display from the fabric tree, click a switch entry.

2.9.4
Graphic Window

The graphic window presents graphic information about fabrics and switches such as the fabric topology and the switch faceplate. The window length can be adjusted by clicking and dragging the window border that it shares with the data window.

2.9.5
Data Window and Tabs

The data window presents a table of data and statistics associated with the selected tab. Use the scroll bar to browse through the data. The window length can be adjusted by clicking and dragging the border that it shares with the graphic window.

Adjust the column width by moving the pointer over the column heading border shared by two columns until a right/left arrow graphic is displayed. Click and drag the arrow to the desired width.

The data window tabs present options for the type of information to display in the data window. These options vary depending on the display.

2.9.6
Working Status Indicator

The working status indicator, located in the lower right corner of SANbox Manager window, shows when the management workstation is exchanging information with the fabric. As conditions change, the fabric forwards this information to the management workstation where it is reflected in the various displays.

2.10 Using the Topology Display

The topology display shown in Figure 2-10 polls the selected fabric and displays its topology. Switches and inter-switch links (ISL) appear in the graphic window and use color to indicate status. Consider the following topology display features:

- Switch and link status
- Working with switches and links
- Topology data windows

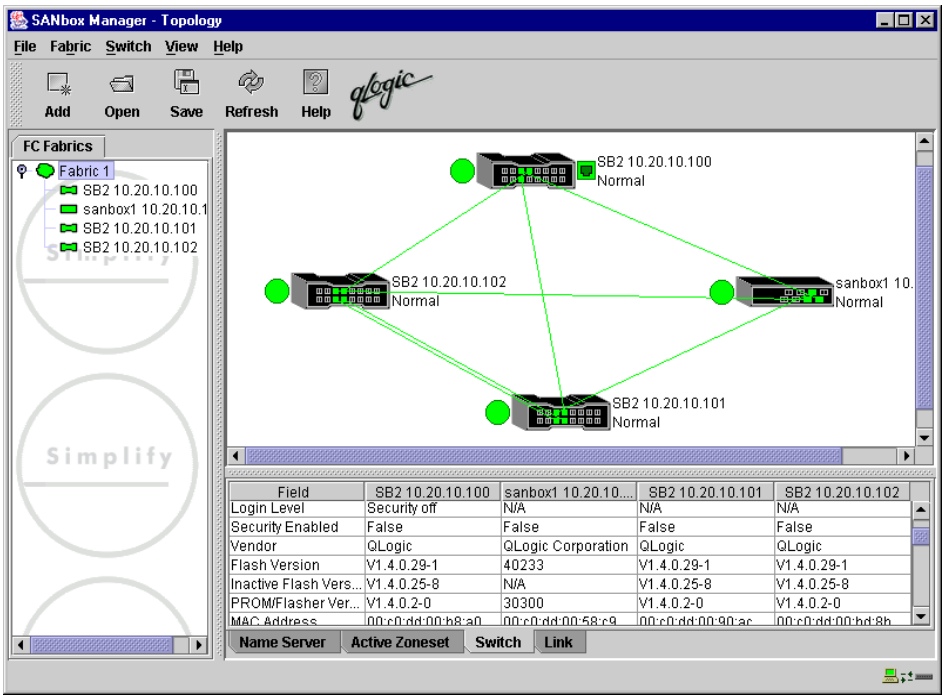


Figure 2-10 Topology Display

2.10.1 Switch and Link Status

Switch icon shape and color provide information about the switch and its operational state. Lines represent links between switches. The topology display uses green to indicate normal operation, yellow to indicate operational with errors, red to indicate inactive or failure, and blue to indicate unknown. Refer to ”Fabric Status” on page 3-6 for more information about topology display icons.

2.10.2
Working with Switches and Links

Switch and link icons are selectable and moveable, and serve as access points for other displays and menus. You select switches and links to display information about them, modify their configuration, or delete them from the display. The context-sensitive popup menus are accessible through the switch and link icons.

2.10.2.1
Selecting Switches and Links

Selected switch icons are highlighted in violet. Selected ISLs are highlighted in yellow. You can select switches and links in the following ways.

- To select a switch or a link, click the icon or link.
- To select multiple switches or links, hold down the Control key and select.
- To select all switches or links, right-click in the graphic window background. Select **Select All Switches** or **Select All Links** from the popup menu.

To cancel a selection, press and hold the Control key, and select the item again. To cancel multiple selections, click in the graphic window background.

2.10.2.2
Arranging Switches in the Display

You can arrange individual switch icons in the topology display or allow SANbox Manager to arrange all switch icons for you:

- To move an individual switch icon, click and drag the icon to another location in the graphic window. Links stretch or contract to remain connected.
- To arrange all switch icons in the topology display, open the View menu and select **Layout Topology**.

By default, the **Toggle Auto Layout** box in the View menu is checked which allows SANbox Manager to arrange the icons when you select **Layout Topology**.

You can save a custom arrangement, or layout, and restore that layout during a SANbox Manager session. Begin by arranging the icons, then open the View menu and select **Remember Layout**. To restore the saved layout, open the View menu, uncheck the **Toggle Auto Layout** box, and select **Layout Topology**.

2.10.2.3
Opening the Faceplate Display and Popup Menus

The faceplate display shows the front of a single switch and its ports.

- To open the faceplate display when viewing the topology display, click the switch entry/icon in the fabric tree, or double-click the switch graphic.
- To open the fabric popup menu when viewing the topology display, right-click the graphic window background. The fabric popup menu presents selections to refresh the fabric, select all switches, select all links, or layout topology.

- To open the switch popup menu when viewing the topology display, right-click the switch icon in the graphic window. The switch popup menu presents selections to refresh the switch, delete the switch from the display, open the Switch Properties window, or open the Network Properties window.
- To open the link popup menu, right-click the link. The Link popup menu presents a selection to delete the link from the display.
- To open a faceplate display popup menu, right-click the faceplate graphic in the graphic window. The faceplate popup menu presents selections to refresh the switch, select all ports, manage switch, port, and network properties, extend credits, or run the port loopback tests.

2.10.3
Topology Data Windows

The topology display provides the following data windows corresponding to the data window tabs:

- Name Server – displays all devices logged with the name server and their location within the current fabric configuration. Refer to ”Name Server Data Window” on page 4-3 for more information.
- Active Zoneset – displays the active zone set for the fabric including zones and their member ports. Refer to ”Active Zone Set Data Window” on page 3-8 for more information about this data window. Refer to ”Zoning a Fabric” on page 3-9 for information about zone sets and zones.
- Switch – displays current network and switch configuration data for the selected switches. Refer to ”Switch Data Window” on page 4-4 for more information.
- Link – displays information about inter-switch links. Refer to ”Link Data Window” on page 4-6 for more information.

2.11 Using the Faceplate Display

The faceplate display shown in Figure 2-11 displays the switch name and operational state, and port status. Consider the following functional elements of the faceplate display:

- Port views and status
- Working with ports
- Faceplate data windows

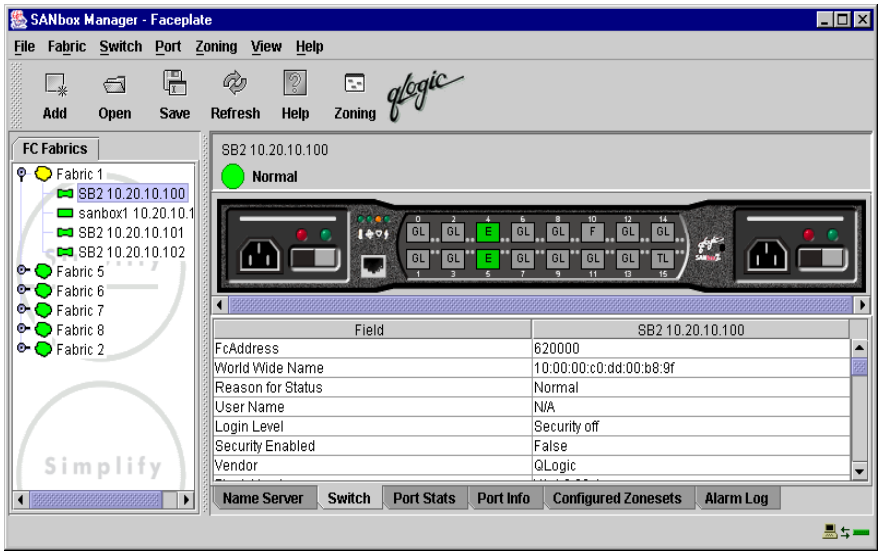


Figure 2-11 Faceplate Display

2.11.1 Port Views and Status

Port color and text provides information about the port and its operational state. Green indicates active; gray indicates inactive. The faceplate display provides the following views of port status corresponding to the View menu options in the faceplate display. Refer to "Monitoring Port Status" on page 5-2 for more information about these displays.

- Port mode
- Port state
- Port speed
- Port media

2.11.2
Working with Ports

Ports are selectable and serve as access points for other displays and menus. You select ports to display information about them in the data window or to modify them. Context sensitive popup menus and properties windows are accessible through the faceplate and port icons.

2.11.2.1
Selecting Ports

You can select ports in the following ways. Selected ports are highlighted with a white border.

- To select a port, click the port in the faceplate display.
- To select a range of consecutive ports, select a port, then press and hold the shift key and select another port. The application selects both end ports and all ports in between in port number sequence.
- To select several non-consecutive ports, hold the Control key while selecting.
- To select all ports, right-click anywhere in the graphic window. Select **Select All Ports** from the popup menu.

To cancel a selection, press and hold the Control key and select it again.

2.11.2.2
Opening Popup Menus

Using the right mouse button, you can open the faceplate popup menu. This popup menu presents several selections to manage the switch and its ports.

- To open the popup menu, right-click anywhere in the graphic window. If no ports are selected, port specific tasks will be unavailable in the menu.
- To select one or more ports and open the Port popup menu, right-click a port.

2.11.3
Faceplate Data Windows

The faceplate display provides the following data windows corresponding to the data window tabs:

- Name Server – displays all devices connected to the switch that are logged with the name server.
- Switch – displays current switch configuration data.
- Port Statistics – displays port performance data for the selected port(s).
- Port Information – displays port detail information for the selected port.
- Configured Zonesets – displays all zone sets, zones, and zone membership in the zoning database.
- Alarm Log – displays the system error information.

Section 3

Managing Fabrics

This section describes the following tasks that manage fabrics:

- Security
- Managing the fabric database
- Displaying fabric information
- Zoning a fabric

3.1 Security

The two components of SANbox2 security are user authentication and fabric security. The user must be authenticated before gaining access to a switch. If an invalid account name/password combination is entered, that user can not access the switch, and thus can not gain access to the fabric. If security is enabled (on) and a valid account name/password combination is entered, that user can access the switch but can not execute any command that exceeds their authority (privileges) level. If security is disabled (off), and a valid account name/password combination is entered, that user has access to all switches in the fabric and can execute all commands (both user and admin), regardless of their authority (privileges) level.

3.1.1 User Authentication

User authentication pertains to accessing a switch based on a valid account name/password combination entered by the user. The valid account name/password/system privileges combinations are set up by the system administrator, and define which set of system commands each user may execute if a valid account name/password combination is entered. The system privileges are tied to the account name/password combination.

3.1.2 Fabric Security

Fabric security pertains to whether all switches in the fabric are configured to permit access to each switch in that fabric. All switches in the fabric should be configured with the same security setting (enabled/true or disabled/false). By default, security is disabled. Once access is gained to the entry switch in a fabric, that user may access all switches in that fabric.

3.2 Managing the Fabric Database

A fabric database contains the set of fabrics that you have added during a SANbox Manager session. Initially, the SANbox Manager application opens with an empty fabric database.

3.2.1 Adding a Fabric

To add a fabric to the database, do the following:

1. Open the Fabric menu and select **Add Fabric** to open the Add a New Fabric window as shown in Figure 3-1.

Figure 3-1 Add a New Fabric Window

2. Enter a fabric name and the IP address of the switch through which to manage the fabric.
3. Enter an account name and password. The factory account name and password are (admin, password). The password is for the switch and is stored in the switch firmware. If security is turned off (default), you are not required to enter an account name or password. Refer to "Security" on page 3-1. Refer to the Set Setup Command on page A-37 for account name, password, and security information.
4. Choose the **Add Fabric** button.

Note: A switch supports a combined maximum of 15 logins. This includes SANbox Manager inband and out-of-band logins, Telnet out-of-band logins, and SNMP out-of-band logins. Of this 15, there can be a maximum of 10 SANbox Manager logins. Additional logins will be refused.

3.2.2
Removing a Fabric

To delete a fabric file from the database, do the following:

1. Select a fabric in the fabric tree.
2. Open the Fabric menu and select **Remove Fabric**.

3.2.3
Opening a Fabric View File

To open an existing view file, do the following:

1. Open the File menu, and select **Open View File**, or choose the **Open** button. If the fabric you are currently has changed, you will be prompted to save the changes to the view file before opening a different view file.
2. In the Open View window, enter the name of the file to open.
3. Enter a file password, if necessary.
4. Choose the **Load View File** button. If the fabric has changed, you will be prompted to save before opening the new view.

3.2.4
Saving a Fabric View File

To save a view file, do the following:

1. Open the File menu, and select **Save View As**.
2. In the Save View window, enter a new file name.
3. Enter a file password, if necessary.
4. Choose the **OK** button.

3.2.5
Rediscovering a Fabric

After making changes to or deleting switches from a fabric view, it may be helpful to again view the actual fabric configuration. The rediscover fabric option clears out the current fabric information being displayed, and rediscovers all switch information. To rediscover a fabric, open the Fabric menu, and select **Rediscover Fabric**.

3.2.6
Adding a New Switch to a Fabric

If there are no special conditions to be configured for the new switch, simply plug in the switch and the switch becomes functional with the default fabric configuration. The default fabric configuration settings are:

- Fabric zoning is sent to the switch from the fabric.
- All ports will be GL_Ports.
- The default IP address 10.0.0.1 is assigned to the switch without a gateway or boot protocol configured (RARP, BOOTP, and DHCP).

If you are adding a new switch to a fabric and do not want to accept the default fabric configuration, do the following:

1. If the switch is not new, reset the switch to the factory configuration before adding the switch to the fabric by selecting **Restore Factory Defaults** in the Switch menu.
2. If you want to manage the switch through the Ethernet port, you must first configure the network SNMP configuration using the Network Properties window.
3. Configure any special switch settings. Consider configuring the Default Visibility setting to None in the Zoning Config window to prevent communication with other switches in the fabric until the new switch is configured.
4. Plug in the inter-switch links (ISL), but do not connect the devices.
5. Configure the port types for the new switch (GL_Port, TL_Port, Donor) using the Port Properties window.
6. Connect the devices to the switch.
7. Make any necessary zoning changes using the Edit Zoning window.

3.3
Replacing a Failed Switch

The archive/restore works for all switches. However, the Restore menu item is not available for the inband switches. You can only restore a switch out-of-band (the connection switch). Use the following procedure to replace a failed switch for which an archive is available.

1. At the failed switch:
    a. Turn off the power and disconnect the AC cords.
    b. Note port locations and remove the interconnection cables and SFPs.
    c. Remove the failed switch.

2. At the replacement switch:
   a. Mount the switch in the location where the failed switch was removed.
   b. Install the SFPs using the same ports as were used on the failed switch.

      CAUTION! Do not reconnect inter-switch links, target devices, and initiator devices at this time. Doing so could invalidate the fabric zoning configuration.

   c. Attach the AC cords and power up the switch.
3. Select the failed switch in the topology display. Open the Switch menu and select **Delete**.
4. Restore the configuration from the failed switch to the replacement switch:
   a. Open the faceplate display for the replacement switch. Open the Switch menu and select **Restore**.
   b. In the Restore window, enter the archive file from the failed switch or browse for the file.
   c. Choose the **Restore** button.
5. Reconnect the inter-switch links, target devices, and initiator devices to the replacement switch using the same ports as were used on the failed switch.
6. Reset the replacement switch to activate the configuration formerly possessed by the failed switch including the domain ID and the zoning database. Open the Switch menu and select **Reset Switch**.

3.3.1 Deleting Switches and Links

The SANbox Manager application does not automatically delete switches or links that have failed or have been physically removed from the Fibre Channel network. In these cases, you can delete switches and links to bring the display up to date. If you delete a switch or a link that is still active, the SANbox Manager application will restore it automatically. You can also refresh the display. To delete a switch from the topology display, do the following:

1. Select one or more switches in the topology display.
2. Open the Switch menu and select **Delete**.

To delete a link, do the following:

1. Select one or more links in the topology display.
2. Open the Switch menu and select **Delete**.

3.4 Displaying Fabric Information

The topology display is your primary tool for monitoring a fabric. The graphics window of the topology display provides status information for switches, inter-switch links, and the Ethernet connection to the management workstation.

The data window tabs show name server, switch, and active zone set information. The Active Zoneset tab shows the zone definitions for the active zone set. Refer to "Name Server Data Window" on page 4-3 and "Switch Data Window" on page 4-4 for information about the Name Server and Switch data windows.

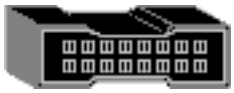
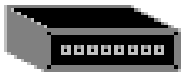
3.4.1 Fabric Status

The fabric updates the topology and faceplate displays by forwarding changes in status to the management workstation as they occur. You can allow the fabric to update the display status, or you can refresh the display at any time. To refresh the topology display, do one of the following:

- Choose the **Refresh** button.
- Open the View menu and select **Refresh**.
- Press the F5 key.
- Right-click anywhere in the background of the topology display and select **Refresh Fabric** from the popup menu.

The topology display uses switch and status icons to provide status information about switches, inter-switch links, and the Ethernet connection. The switch icons indicate 16 port switch or an unknown switch type. The switch status icons, displayed on the left side of a switch, vary in shape and color. Switches controlled by an Ethernet Internet Protocol have a colored Ethernet icon displayed on the right side of the switch. A green Ethernet icon indicates normal operation, yellow indicates operational with errors, and red indicates inactive or failure. Table 3-1 shows the different switch icons and their meanings.

Table 3-1 Topology Display Switch and Status Icons

Switch Icon	Description
	SANbox2-8c/16 Switch Normal operation (Green)
	SANbox2-8c Switch Normal operation (Green)
	Non-QLogic Switch, or a QLogic Switch with different security than the fabric management switch.
	Switch communication normal (Green)
	Switch is operational with errors (Yellow)
	Switch communication interrupted (Red)
	Switch management communication unknown or unmanageable (Blue)
	Fabric Management Switch Ethernet connection normal (Green)
	Fabric Management Switch Ethernet connection critical (Red)
	Fabric Management Switch Ethernet connection warning (Yellow)

3.4.2
Active Zone Set Data Window

The Active Zoneset data window displays the zone membership for the active zone set that resides on the fabric management switch. The active zone set is the same on all switches in the fabric – you can confirm this by adding a fabric through another switch and comparing Active Zone Set displays.

To open the Active Zoneset data window, choose the **Active Zoneset** tab below the data window in the topology display. Refer to "Configured Zonesets Data Window" on page 4-7 for information about the zone set definitions on a particular switch. Refer to "Zoning a Fabric" on page 3-9 for more information about zone sets and zones.

The Active Zoneset data window, shown in Figure 3-2, uses display conventions for expanding and contracting entries that are similar to the fabric tree. An entry handle located to the left of an entry in the tree indicates that the entry can be expanded. Click this handle or double-click the following entries to expand or contract them:

- A zone set entry expands to show its member zones.
- A zone entry expands to show its member ports.
- A port entry expands to show the port Fibre Channel address.
- A Fibre Channel address entry expands to show the port worldwide name.

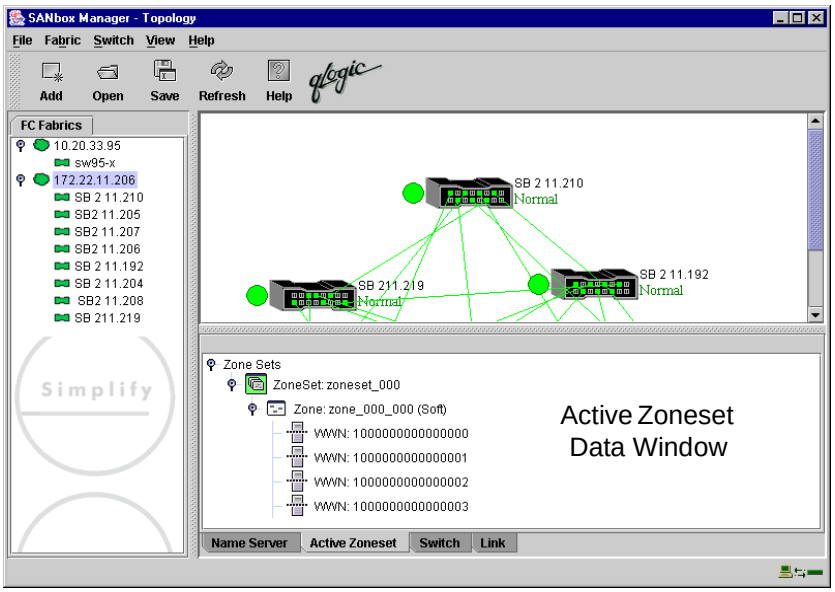


Figure 3-2 Active Zone Set Data Window

3.5 Zoning a Fabric

Zoning enables you to divide the ports and devices of the fabric into zones for more efficient and secure communication among functionally grouped nodes. This subsection addresses the following topics:

- Zoning concepts
- Using the Zoning Config window
- Restoring default zoning
- Using the Edit Zoning window
- Merging fabrics and zoning
- Managing zone sets
- Managing zones
- Managing aliases

3.5.1 Zoning Concepts

The following zoning concepts provide some context for the zoning tasks described in this section:

- Zones
- Aliases
- Zone sets
- Zoning database
- Zoning configuration

3.5.1.1 Zones

A zone is a named group of ports or devices that can communicate with each other. Membership in a zone can be defined by port number, device Fibre Channel address, or device World Wide Name (WWN). Zone members can communicate only with members of the same zone. Zones can overlap; that is, a port or device can be a member of more than one zone.

Three types of zones are supported. The following zone types define increasingly restrictive levels of communication.

- Soft zone
- Access Control List (ACL) - hard zone
- Virtual Private Fabric (VPF) - hard zone

3.5.1.1.1
Soft Zones

Soft zoning divides the fabric for purposes of controlling discovery. Members of the same soft zone automatically discover and communicate freely with all other members of the same zone. The soft zone boundary is not secure; traffic across soft zones can occur if addressed correctly. Soft zones that include members from multiple switches need not include the ports of the inter-switch links. Soft zone boundaries yield to ACL and VPF zone boundaries. Soft zones can overlap; that is, a port can be a member of more than one soft zone. Membership can be defined by Fibre Channel address, port ID and domain ID, or worldwide name. Soft zoning supports all port modes.

3.5.1.1.2
Access Control List Hard Zones

Access Control List (ACL) zoning divides the fabric for purposes of controlling discovery and inbound traffic. ACL zoning is a type of hard zoning that is hardware enforced. This type of zoning is useful for controlling access to certain devices without totally isolating them from the fabric. Members can communicate with each other and transmit outside the ACL zone, but cannot receive inbound traffic from outside the zone. The ACL zone boundary is secure against inbound traffic. ACL zones can overlap; that is, a port can be a member of more than one ACL zone. ACL zones that include members from multiple switches need not include the ports of the inter-switch links. ACL zone boundaries supersede soft zone boundaries, but yield to VPF zone boundaries. Membership can be defined only by port ID and domain ID. ACL zoning supports all port modes except TL_Ports.

3.5.1.1.3
Virtual Private Fabric Hard Zones

Virtual Private Fabric (VPF) zoning divides the fabric for purposes of controlling discovery and both inbound and outbound traffic. This type of zoning is useful for providing security and reserving paths between devices to guarantee bandwidth. VPF zoning is a type of hard zoning that is hardware enforced. Members can only transmit to and receive from members of the same VPF zone. The VPF zone boundary is secure against both inbound and outbound traffic. VPF zones that include members from multiple switches must include the ports of the inter-switch links. VPF zones cannot overlap; that is, a port can be a member of only one VPF zone. VPF zone boundaries supersede both soft and ACL zone boundaries. Membership can be defined only by port ID and domain ID. VPF zoning supports all port modes.

Note: Domain ID conflicts can result in automatic reassignment of switch domain IDs. These reassignments are not reflected in zones that use domain ID and port number pairs or Fibre Channel addresses to define their membership. Be sure to reconfigure zones that are affected by a domain ID change. To prevent zoning definitions from becoming invalid when the membership is defined by domain ID/port number or Fibre Channel address, you must lock domain IDs. Refer to "Domain ID and Domain ID Lock" on page 4-12 and "Set Config Command" on page A-25 for more information.

3.5.1.2
Aliases

To make it easier to add a group of ports or devices to one or more zones, you can create an alias. An alias is a named set of ports or devices that are grouped together for convenience. Unlike zones, aliases impose no communication restrictions between its members. You can add an alias to one or more zones. However, you cannot add a zone to an alias, nor can an alias be a member of another alias.

3.5.1.3
Zone Sets

A zone set is a named group of zones. A zone can be a member of more than one zone set. All zones that are not members of a zone set belong to the orphan zone set. The orphan zone set is saved on the switch. Each switch in the fabric maintains its own zoning database containing one or more zone sets. This zoning database resides in non-volatile or permanent memory and is therefore retained after a reset. Refer to "Configured Zonesets Data Window" on page 4-7 for information about displaying the zoning database.

To apply zoning to a fabric, choose a zone set and activate it. When you activate a zone set, the switch distributes that zone set to every switch in the fabric. Refer to "Active Zone Set Data Window" on page 3-8 for information about displaying the active zone set.

3.5.1.4
Zoning Database

Each switch has its own zoning database. The zoning database is made up of all aliases, zones, and zone sets that have been created on the switch or received from other switches. The switch maintains two copies of the zoning database: one copy is maintained in temporary memory for editing purposes; the second copy is maintained in permanent memory. Zoning database edits are made on an individual switch basis and are not propagated to other switches in the fabric when saved. The zoning limits for a fabric are as follows:

- Maximum number of zonesets is 256
- Maximum number of zones is 256
- Maximum total number of zone set members is 1000
- Maximum number of members per zone is 2000
- Maximum number of aliases is 256
- Maximum number of members per alias is 2000
- Maximum total number of zone and alias members is 2000

3.5.1.5
Zoning Configuration

You can set the Auto Save and Default Visibility zoning configuration parameters using SANbox Manager or the Set Config Zoning command. The Auto Save parameter determines whether changes to the active zone set that a switch receives from other switches in the fabric will be saved to permanent memory on that switch. The Default Visibility parameter permits or prohibits communication between switches when there is no active zone set. Refer to "Using the Zoning Config Window" on page 3-12 for information about zoning configuration using SANbox Manager. Refer also to the Set Config Command on page A-25 for information about zoning configuration using the CLI.

3.5.2
Using the Zoning Config Window

Use the Zoning Config window to change the Auto Save and Default Visibility configuration parameters. In the faceplate display, open the Zoning menu and select **Edit Zoning Config** to open the Zoning Config window shown in Figure 3-3. After making changes, choose the **OK** button to put the new values into effect.

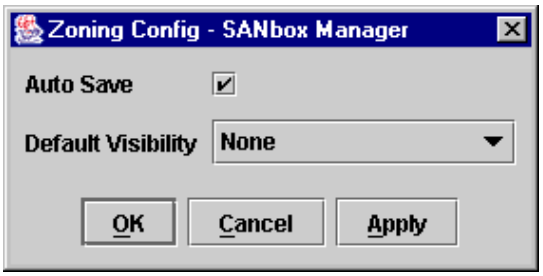


Figure 3-3 Zoning Config Window

3.5.2.1
Auto Save

The Auto Save parameter determines whether changes to the active zone set that a switch receives from other switches in the fabric will be saved to permanent memory on that switch. Changes are saved when an updated zone set is activated. Zoning changes are always saved to temporary memory. However, if Auto Save is enabled, the switch firmware saves changes to the active zone set in both temporary and permanent memory. If Auto Save is disabled, changes to the active zone set are stored only in temporary memory.

3.5.2.2
Default Visibility

Default visibility determines the level of communication that is permitted between devices when there is no active zone set. The default visibility parameter can be set differently on each switch. When default visibility is enabled (ALL) on a switch, all ports on the switch can communicate with all ports on switches that also have default visibility enabled. When Default Visibility is disabled (NONE) on a switch, none of the ports on that switch can communicate with any other switch in the fabric.

3.5.3
Restoring Default Zoning

Restoring the default zoning clears the switch of all zoning definitions.

CAUTION! The use of this command will deactivate the active zone set. If the switch is not isolated from the fabric, this command will deactivate the active zone set for the entire fabric.

To restore the default zoning for a switch:

1. In the faceplate display, open the Zoning menu and select **Restore Default Zoning**.
2. Choose the **OK** button to confirm that you want to restore default zoning and save changes to the zoning database.

3.5.4
Merging Fabrics and Zoning

If you join two fabrics, the active zone sets from the two fabrics attempt to merge. The fabrics may consist of a single switch or many switches already connected together. The switches in the two fabrics attempt to create a new active zone set containing the union of each fabric's active zone set. The propagation of zoning information only affects the active zone set, not the configured zone sets.

3.5.4.1
Zone Merge Failure

If a zone merge is unsuccessful, the inter-switch links between the fabrics will isolate due to a zone merge failure, which will generate an alarm log entry. The reason for the E_Port isolation can also be determined by viewing the port information. Refer to "Port Information Data Window" on page 5-7and the "Show Command" on page A-41(Port keyword).

A zone merge will fail if the two active zone sets have member zones with identical names that differ in content or type. For example, consider Fabric A and Fabric B each with a zone in its active zone set named "ZS1". Fabric A "ZS1" contains a member specified by Domain ID 1 and Port 1; Fabric B "ZS1" contains a member specified by Domain ID 1 and Port 2. In this case, the merge will fail and the inter-switch links between the fabrics will isolate.

3.5.4.2
Zone Merge Failure Recovery

When a zone merge failure occurs, the conflict that caused the failure must be resolved. You can correct a failure due to a zone conflict by deactivating one of the active zone sets or editing the conflicting zones so that their membership is the same. You can deactivate the active zone set on one switch if the active zone set on the other switch accurately defines your zoning needs. If not, you must edit the zone memberships, and reactivate the zone sets. Refer to "Managing Zones" on page 3-19 for information about adding and removing zone members. To permit the fabrics to join, reset the ports that were isolated. Refer to "Resetting a Port" on page 5-13.

3.5.5
Using the Edit Zoning Window

To edit the zoning database for a particular switch, open the Zoning menu from the faceplate display and select **Edit Zoning** to open the Edit Zoning window shown in Figure 3-4. Changes can only be made to inactive zone sets, which are stored in flash (non-volatile) memory and retained after resetting a switch.

The Edit Zoning window has a Zone Sets tree on the left and a Port/Device (or members) tree on the right. Both trees use display conventions similar to the fabric tree for expanding and contracting zone sets, zones, and ports. An expanded port shows the port Fibre Channel address; an expanded address shows the port worldwide name. You can select zone sets, zones, and ports in the following ways:

- Click a zone, zone set, or port icon.
- Right-click to select a zone set or zone, and open the corresponding popup menu.
- Hold down the Shift key while clicking several consecutive icons.
- Hold down the Control key while clicking several non-consecutive icons.

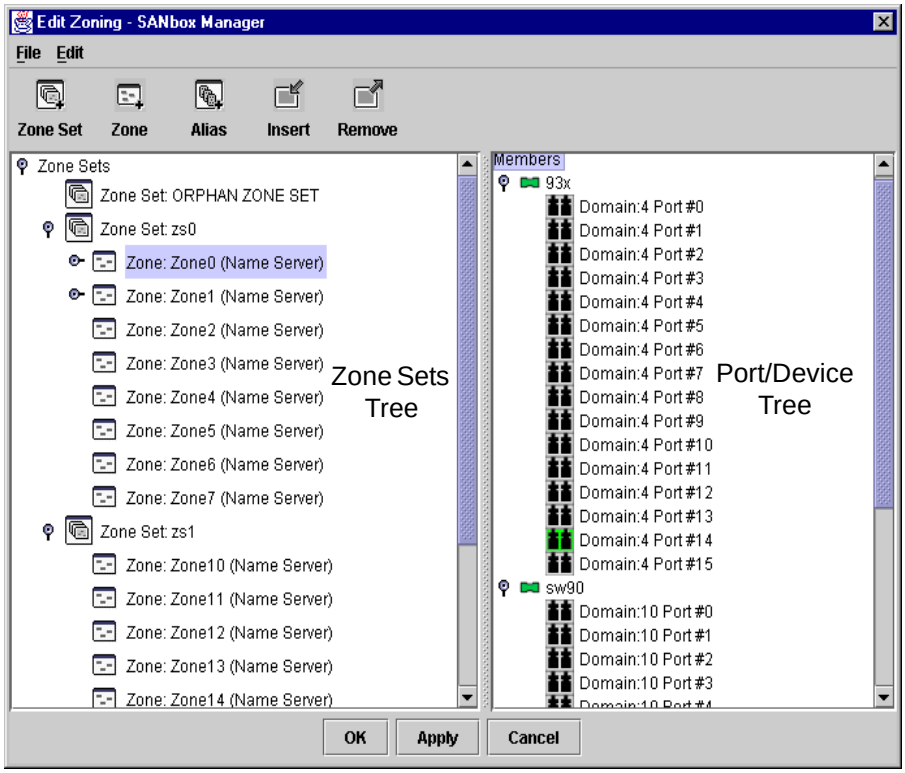


Figure 3-4 Edit Zoning Window

Using tool bar buttons, popup menus, or a drag-and-drop method, you can create and manage zone sets and zones in the zoning database. The **Apply** button saves changes to the zoning database without closing the window. The **OK** button saves the zoning changes to the database and closes the window. Table 3-2 describes the zoning tool bar operations:

Table 3-2 Edit Zoning Window Tool Bar Buttons

Tool Bar Button	Description
	Create Zone Set button - create a new zone set
	Create Zone button - create a new zone
	Create Alias button - create another name for a set of objects
	Add Member button - add the selected zone to a zone set, or add the selected port to a zone
	Remove Member button - delete the selected zone from a zone set, or delete the selected port from a zone

3.5.6
Managing Zone Sets

Zoning a fabric involves creating a zone set, creating zones as zone set members, then adding devices as zone members. The zoning database supports multiple zone sets to serve the different security and access needs of your storage area network, but only one zone set can be active at one time. Managing zone sets consists of the following tasks:

- Creating zone sets
- Activating and deactivating zone sets
- Copying a zone to a zone set
- Removing a zone from one zone set or from all zone sets
- Removing a zone set
- Removing all zoning definitions

Note: Changes that you make to the zoning database are limited to the managed switch and do not propagate to the rest of the fabric. To distribute changes to configured zone sets fabric wide, you must edit the zoning databases on the individual switches.

3.5.6.1
Creating a Zone Set

To create a zone set, do the following:

1. Open the Zoning menu, and select **Edit Zoning** to open the Edit Zoning window.
2. Open the Edit menu, and select **Create Zone Set** to open the Create Zone Set window.
3. Enter a name for the zone set, and choose the **OK** button. The new zone set name is displayed in the Zone Sets window. A zone set name must begin with a letter and be no longer than 64 characters. Valid characters are 0-9, A-Z, a-z, &, _, and -.
4. To create new zones in a zone set, do one of the following:
   - Right-click a zone set and select **Create A Zone** from the popup menu. In the Create a Zone window, enter a name for the new zone, and choose the **OK** button. The new zone name is displayed in the Zone Sets window.
   - Copy an existing zone by dragging a zone into the new zone set. Refer to ”Copying a Zone to a Zone Set” on page 3-18.
5. Choose the **Apply** button to save changes to the zoning database.

3.5.6.2
Activating and Deactivating a Zone Set

You must activate a zone set to apply its zoning definitions to the fabric. Only one zone set can be active at one time. When you activate a zone set, the switch distributes that zone set to the temporary zoning database on every switch in the fabric replacing any zone set of the same name. If Auto Save is enabled, the zone set is saved in the permanent zoning database also. Refer to ”Auto Save” on page 3-13.

The purpose of the deactivate function is to suspend all fabric zoning which results in free communication fabric wide or no communication depending on the default visibility setting. Refer to ”Default Visibility” on page 3-13 for more information. It is not necessary to deactivate the active zone set before activating a new one.

- To activate a zone set, open the Zoning menu and select **Activate Zone Set** to open the Activate Zone Set window. Select a zone set from the Select Zone Set pull-down menu, and choose the **Activate** button.
- To deactivate the active zone set, open the Zoning menu, select **Deactivate Zone Set**. Acknowledge the warning about traffic disruption, and choose the **Yes** button to confirm that you want to deactivate the active zone set.

3.5.6.3
Copying a Zone to a Zone Set

To copy an existing zone and its membership from one zone set to another, select the zone and drag it to the chosen zone set. Choose the **Apply** button to save changes to the zoning database.

3.5.6.4
Removing a Zone from a Zone Set or from All Zone Sets

You can remove a zone from a zone set or from all zone sets in the database.

1. In the Faceplate Display, open the Zoning menu and select **Edit Zoning** to open the Edit Zoning window.
2. In the Zone Sets tree, select the zone(s) to be removed.
3. Open the Edit menu, and select **Remove** to remove the zone from the zone set, or select **Remove from All Zones** to remove the zone from all zone sets.
4. Choose the **Apply** button to save changes to the zoning database.

Alternatively, you may use shortcut menus to remove a zone from a zone set or from all zone sets in the database.

3.5.6.5
Removing a Zone Set

Removing a zone set from the database affects the member zones in the following ways.

- Member zones that are members of other zone sets are not affected.
- Member zones that are not members of other zone sets become members of the orphan zone set. The orphan zone set is saved on the switch.

To delete a zone set from the database, do the following:

1. In the faceplate display, open the Zoning menu and select **Edit Zoning** to open the Edit Zoning window.
2. In the Zone Sets tree, select the zone set to be removed.
3. Open the Edit menu, and select **Remove** to remove the zone set.
4. Choose the **Apply** button to save changes to the zoning database.

Alternatively, you may use shortcut menus to remove a zone set from the database.

3.5.6.6
Removing All Zoning Definitions

To clear all zone and zone set definitions from the zoning database, choose one of the following:

- Open the Edit menu and select **Remove All**. In the Remove All window, choose the **Yes** button to confirm that you want to delete all zones and zone sets.
- Right-click the Zone Sets heading at the top of the Zone Sets tree, and select **Clear Zoning** from the popup menu. Choose the **Yes** button to confirm that you want to delete all zone sets and zones.

3.5.7
Managing Zones

Managing zones involves the following:

- Creating a zone in a zone set
- Adding zone members
- Renaming a zone or a zone set
- Removing a zone member
- Removing a zone from a zone set
- Removing a zone from all zone sets
- Changing zone types

Note: Changes that you make to the zoning database are limited to the managed switch and do not propagate to the rest of the fabric. To distribute changes to configured zone sets fabric wide, you must edit the zoning databases on the individual switches.

3.5.7.1
Creating a Zone in a Zone Set

When a zone is created, its zone type is soft. To change the zone type to a hard zone, refer to "Changing Zone Types" on page 3-22 for more information. Refer to "Zones" on page 3-9 for information on zone types (soft and hard). To create a zone in a zone set, do the following:

1. Open the Zoning menu, and select **Edit Zoning** to open the Edit Zoning window.
2. Open the Edit menu and select **Create a Zone**.
3. In the Create a Zone window, enter a name for the new zone, and choose the **OK** button. The new zone name is displayed in the Zone Sets window. A zone name must begin with a letter and be no longer than 64 characters. Valid characters are 0-9, A-Z, a-z, &, _, and -.

   Note: If you enter the name of a zone that already exists in the database, the SANbox Manager application will create a copy of that zone and its membership in the zone set.

4. To add ports or devices to the zone, do one of the following:
   - In the zone set tree, select the zone set. In the graphic window, select the port to add to the zone. Open the Edit menu and select **Add Members**.
   - Select a port by port number, Fibre Channel address, or worldwide name in the Port/Device tree, and drag it into the zone.
   - Select a port by port number, Fibre Channel address, or worldwide name in the Port/Device tree. Right-click the zone and select **Add Zone Members** from the popup menu.
5. Choose the **Apply** button to save changes to the zoning database.

3.5.7.2
Adding Zone Members

Adding a zone member to a zone will affect every zone set in which that zone is a member. To add member ports/devices to a zone, do one of the following:

- Select a port by port number, Fibre Channel address, or worldwide name in the Port/Device tree, and drag it into the zone. To select and drag multiple ports/devices, press and hold the Control key while dragging.
- Select one or more ports by port number, Fibre Channel address, or worldwide name in the Port/Device tree. Right-click the zone and select **Add Zone Members** from the popup menu.

Choose the **Apply** button to save changes to the zoning database.

Note: Domain ID conflicts can result in automatic reassignment of switch domain IDs. These reassignments are not reflected in zones that use domain ID/port number pair to define their membership. Be sure to reconfigure zones that are affected by a domain ID change.

3.5.7.3
Renaming a Zone or a Zone Set

To rename a zone, do the following:

1. In the Zone Sets tree of the Edit Zoning window, click the zone/zone set to be renamed.
2. Open the Edit menu and select **Rename**.
3. In the Rename Zone/Rename Zone Set window, enter a new name for the zone/zone set.
4. Choose the **OK** button.

3.5.7.4
Removing a Zone Member

Removing a zone member will affect every zone and zone set in which that zone is a member. To remove a member from a zone:

1. In the Edit Zoning window, select the zone member to be removed.
2. Open the Edit menu and select **Remove**.
3. Choose the **OK** button to save changes and close the Edit Zoning window.

3.5.7.5
Removing a Zone from a Zone Set

Removing a zone from a zone set will affect every zone set in which that zone is a member. Zones that are no longer members of any zone set are moved to the orphan zone set. The orphan zone set is saved on the switch. To delete a zone from a zone set:

1. In the Edit Zoning window, select the zone to be removed.
2. Open the Edit menu and select **Remove**.
3. Choose the **OK** button to save changes and close the Edit Zoning window.

3.5.7.6
Removing a Zone from All Zone Sets

Zones that are no longer members of any zone set are moved to the orphan zone set. The orphan zone set is saved on the switch. To delete a zone from all zone sets, do the following:

1. In the Edit Zoning window, select the zone to be removed.
2. Open the Edit menu and select **Remove Zone from All Sets**.
3. Choose the **OK** button to save changes and close the Edit Zoning window.

3.5.7.7
Changing Zone Types

To change a zone type, do the following:

1. In the faceplate display, select the switch with the zone type to change.
2. Choose the **Zoning** button to open the Edit Zoning window.
3. In the Zone Sets tree, select the zone to change.
4. Open the Edit menu and select **Set Zone Type** to open the Set Zone Type window.
5. Open the Zone Type pull-down menu and select **Soft**, **ACL**, or **VPF**.
   - Soft zoning is the least restrictive type of zoning.
   - ACL zoning is hard zoning and is enforced by hardware and defines access to a given port. ACL zones need not include inter-switch links.
   - VPF zoning is hard zoning that defines ports that can communicate with each other. VPF zones must include inter-switch links.

3.5.8
Managing Aliases

An alias is a collection of objects that can be zoned together. An alias is not a zone, and can not have a zone or another alias as a member.

Note: Changes that you make to the zoning database are limited to the managed switch and do not propagate to the rest of the fabric. To distribute changes to configured zone sets fabric wide, you must edit the zoning databases on the individual switches.

3.5.8.1
Creating an Alias

To create an alias, do the following:

1. Open the Zoning menu, and select **Edit Zoning** to open the Edit Zoning window.
2. Open the Edit menu, and select **Create Alias** to open the Create Alias window.
3. Enter a name for the alias, and choose the **OK** button. The alias name is displayed in the Zone Sets window. An alias name must begin with a letter and be no longer than 64 characters. Valid characters are 0-9, A-Z, a-z, &, _, and -.
4. Choose the **OK** button to save the alias name to the zoning database.

3.5.8.2
Adding a Member to an Alias

The three ways to add a member to an alias are:

- Drag-and-drop method.
- Select the alias in the left pane and the member in the right pane to add to that alias, and choose the **Insert** button.
- Select the alias in the left pane and the member in the right pane to add to that alias, and open the Edit menu and select **Add Members**.

To add a member to an alias using the drag-and-drop method, do the following:

1. In the right pane, click and hold down the mouse button on the member to be added to the alias.
2. Drag the selected member from the right pane to the alias in the left pane.

To add a member to an alias using the menu options, do the following:

1. Open the Zoning menu, and select **Edit Zoning** to open the Edit Zoning window.
2. In the left pane, select an alias.
3. In the right pane, select the member to add to the selected alias.
4. Choose one of the following:
   - Open the Edit menu and select **Add Members**.
   - Choose the **Insert** button.
5. Choose the **OK** button to save changes and close the Edit Zoning window.

3.5.8.3
Removing an Alias from All Zones

To remove an alias from all zones, do the following:

1. In the Zone Sets tree in the Edit Zoning window, select the alias to be removed.
2. Open the Edit menu, and select **Remove Alias from All Zones**.
3. Choose the **Yes** button in the Remove window.

Section 4

Managing Switches

This section describes the following tasks that manage switches in the fabric.

- Displaying switch information
- Managing alarms
- Exporting name server information to a file
- Paging a switch
- Resetting a switch
- Setting the date and time
- Configuring a switch
- Archiving a switch
- Restoring a switch
- Managing firmware
- Restoring the factory default configuration

4.1 Displaying Switch Information

The faceplate display and data windows provide the following specific switch information:

- Hardware status
- Name server information
- Switch specifications and addresses
- Configuration parameters
- Performance statistics
- Configured zone sets
- Alarm log information

Figure 4-1 shows the faceplate display for the SANbox2-8c and SANbox2-16 switches.

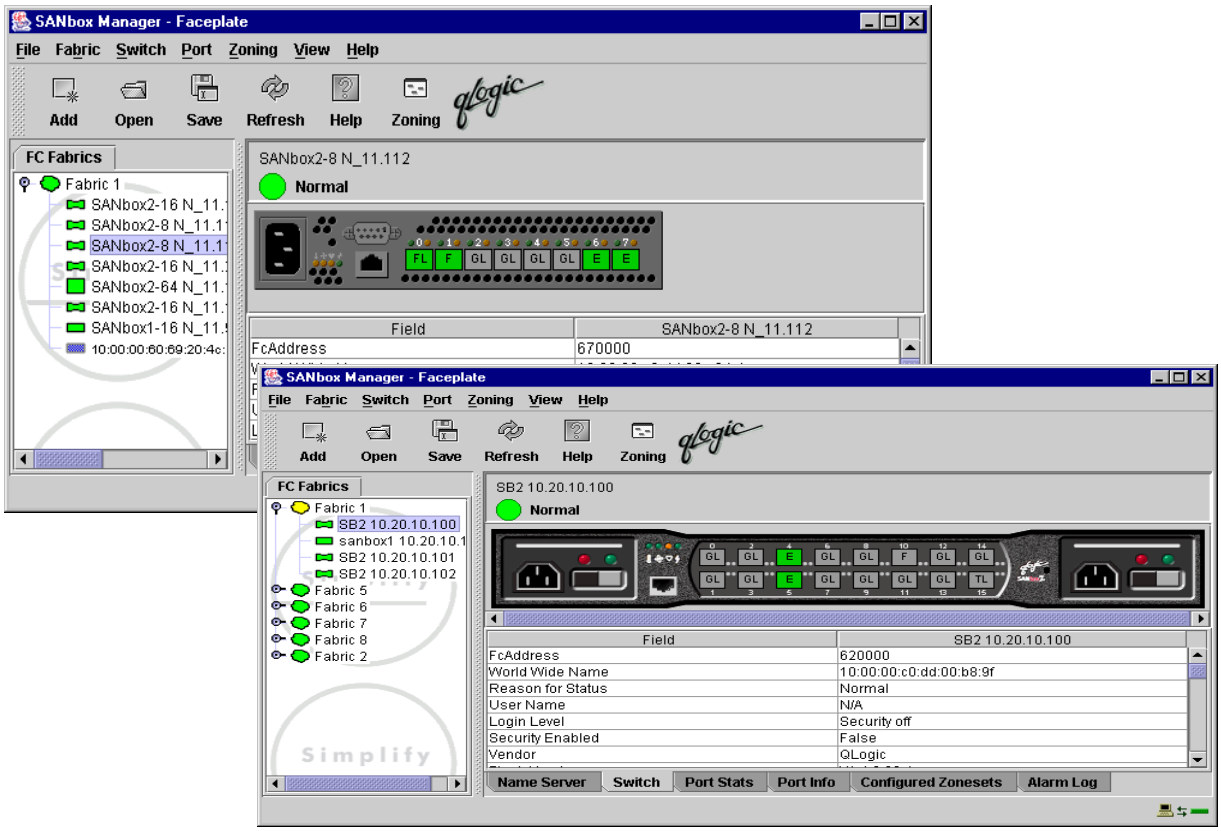


Figure 4-1 Faceplate Display

The fabric updates the topology and faceplate displays by forwarding changes in status to the management workstation as they occur. You can allow the fabric to update the switch status, or you can refresh the display at any time. To refresh switch status in the display, do one of the following:

- Choose the **Refresh** button.
- Open the View menu and select **Refresh**.
- Press the F5 key.
- Right-click a switch in the topology display and select **Refresh Switch** from the popup menu.
- Right-click in the graphic window of the faceplate display, and select **Refresh Switch** from the popup menu.

4.1.1
Displaying Hardware Status

A switch is equipped with the following chassis LEDs that provide hardware status information:

- Chassis Over Temperature LED - indicates air temperature inside the switch.
- Fan Fail LED - indicates operational status of both fans.
- Heartbeat LED - indicates the status of the internal switch processor and the results of Power On Self Tests (POSTs).
- Input Power LED - indicates the voltage status at the switch logic circuitry.

In the SANbox2-16 faceplate display, you can display a summary of this status information by placing the cursor on the chassis LED cluster as shown in Figure 4-2. Refer to installation guide for your switch for more information about the chassis LEDs.

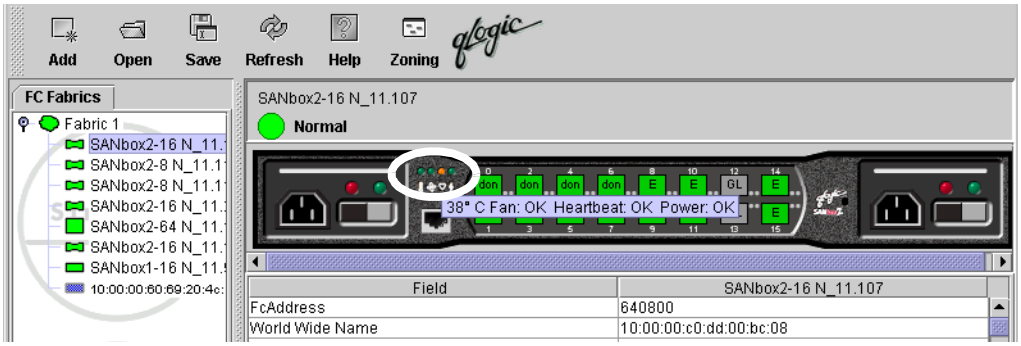


Figure 4-2 Faceplate Display - Chassis LED Cluster

4.1.2
Name Server Data Window

The Name Server data window displays information about the devices that are logged into the fabric. Choose the Name Server tab below the data window to display name server information for all devices that are logged into the selected fabric. To narrow the display to devices that are logged into specific switches, select one or more switches in the fabric tree or the topology display. Refer to Table 4-1 for a description of the entries in the Name Server data window. Refer to ”Exporting Name Server Information to a File” on page 4-10 for exporting name server information.

Table 4-1 Name Server Data Window Entries

Entry	Description
Dev	Device number in the fabric
Switch	Switch name
Port	Port number (0–8 or 0–15)
Address	Fibre Channel address
Type	Node type
WWNN	Worldwide node name
WWPN	Worldwide port name
Vendor	Host Bus Adapter/Device Vendor
FC-4 Types	Device Fibre Channel protocol types
Active Zones	The active zone to which the device belongs

4.1.3 Switch Data Window

The Switch data window displays current network and switch information for the selected switches. Refer to ”Configuring a Switch” on page 4-11 for more information about the Switch data window. To open the Switch data window, select one or more switches in the topology display and choose the **Switch** tab below the window. You can also open the Switch data window in the faceplate display. Table 4-2 describes the Switch data window entries.

Table 4-2 Switch Data Window Entries

Entry	Description
FcAddress	Switch Fibre Channel address
World Wide Name	Switch worldwide name
Reason for Status	Additional status information
User Name	Account name
Login Level	Authority level
Vendor	Switch manufacturer
Flash Version	Active Flash
Inactive Flash Version	Inactive firmware version

Table 4-2 Switch Data Window Entries (Continued)

Entry	Description
PROM/Flasher Version	Firmware version
MAC Address	Media Access Control address
IP Address	Internet Protocol Address
Subnet Mask	Mask that determines the IP address subnet
Gateway	Gateway address
Negotiated Domain ID	The domain ID currently being used by the fabric
Configured Domain ID	The domain ID defined by network administrator
Domain ID Lock	Domain ID lock status. Prevents (True) or permits (False) dynamic domain ID reassignment.
Number of Ports	Number of ports on the switch
Switch Type	Switch model
Operational State	Switch operational state: Online, Offline, Diagnostic
Administrative State	Current switch administrative state
Configured Admin State	Switch administrative state stored in the switch configuration
MFS Timeout	Multi frame sequencing timeout value
RA Timeout	Resource allocation timeout value
RT Timeout	Receiver transmitter timeout value
ED Timeout	Error detect timeout value
Zoning Merge Mode	Active zone set merge or all zone set merge
Zoning Merge Auto Save	Zoning auto save status. Saves zoning updates in temporary and permanent memory (True) or only in temporary memory (False).
Zoning Default Visibility	Zoning visibility status. Permits (All) or prevents (None) communication with other switches in the absence of an active zone set.
Temperature	Internal switch temperature °C
Fan 1 Status	Fan status
Fan 2 Status	Fan status
Fan 3 Status	Fan status

Table 4-2 Switch Data Window Entries (Continued)

Entry	Description
Power Supply 1 Status	Power supply 1 status
Power Supply 2 Status	Power supply 2 status
Beacon Status	Beacon status. Switch LEDs are blinking (On) or not (off).
Broadcast Support	Broadcast support status. Broadcast support is enabled or disabled (default).
Inband Enabled	Inband management status. Permits (True) or prevents (False) a switch from being managed over an ISL.

4.1.4
Link Data Window

The Link data window displays information about all switch links in the fabric or selected links. This information includes the switch name, the port number at the end of each link, and the link status. To open the Link data window, choose the **Link** tab below the window.

4.1.5
Port Statistics Data Window

The Port Statistics data window displays port performance data for the selected ports. To open the Port Statistics data window, choose the **Port Stats** tab below the data window in the faceplate display. Refer to Table 5-5 for a description of the Port Statistics data window entries.

The Statistics pull-down menu is available on the Port Statistics data window, and provides different ways to view detailed port information. Choose the down arrow to open the pull-down menu. Open the pull-down menu and select **Absolute** to view the total count of statistics since the last switch reset. Select **Rate** to view the number of statistics counted per second over the polling period. Select **Baseline** to view the total count of statistics since the last time the baseline was set. Choose the **Clear Baseline** button to set the current baseline.

4.1.6
Port Information Data Window

The Port Information data window displays port detail information for the selected ports. To open the Port Statistics data window, choose the **Port Info** tab below the data window in the faceplate display. Refer to Table 5-6 for a description of the Port Information data window entries.

4.1.7

Configured Zonesets Data Window

The Configured Zonesets data window displays all zone sets, zones, and zone membership in the zoning database, as shown in Figure 4-3. To open the Configured Zonesets data window, choose the **Configured Zonesets** tab below the data window in the faceplate display.

The Configured Zonesets data window uses display conventions for expanding and contracting entries that are similar to the fabric tree. An entry handle located to the left of an entry in the tree indicates that the entry can be expanded. Click this handle or double-click the following entries to expand or contract them:

- A zone set entry expands to show its member zones.
- A zone entry expands to show its members by port number, worldwide name, or Fibre Channel address.

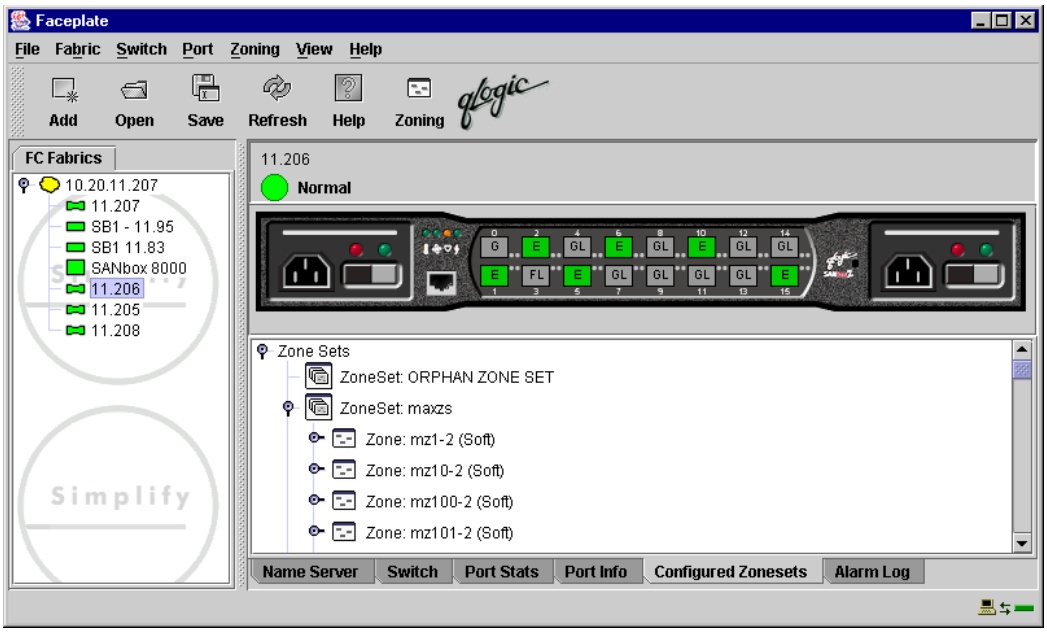


Figure 4-3 Configured Zonesets Data Window

4.1.8
Alarm Log Data Window

The Alarm Log data window displays switch event information. To open the Alarm Log data window, choose the **Alarm Log** tab in the faceplate display.

Table 4-3 Alarm Log Data Window Entries

Entry	Description
Time Stamp	The time the event occurred.
Alarm Type	The configured alarm type.
Description	Additional information about the alarm.

4.2
Managing Alarms

You can configure the switch to generate and log alarms. Display the Alarm Log by choosing the Alarm Log tab in the faceplate display. Refer to ”Alarm Log Data Window” on page 4-8 for information about the alarm log. You can also export the alarm log to a file in .XML format.

4.2.1
Configuring Alarms

Configuring an alarm involves choosing an event type, rising and falling thresholds, a sampling interval, and finally enabling or disabling the alarm. To configure alarms, do the following:

1. In the faceplate display, open the Switch menu and select **Configure Alarm Thresholds**.
2. The Alarm Threshold Configuration window shown in Figure 4-4 prompts you to select an event, set thresholds, set a sampling interval, and enable or disable the alarm.

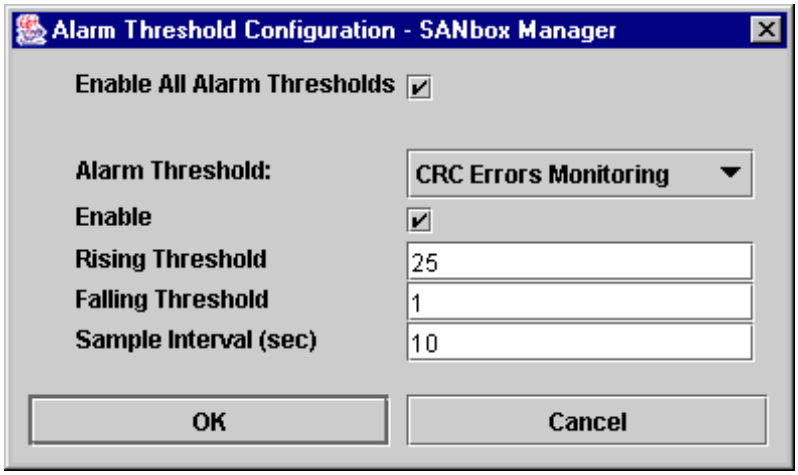


Figure 4-4. Alarm Threshold Configuration Window

3. Select an event type from the Alarm Threshold pull-down menu. Choose from the following options:
   - CRC error monitoring
   - Decode error monitoring
   - ISL monitoring
   - Login monitoring
   - Logout monitoring
   - Loss of signal monitoring
4. Enter a value for the falling threshold. The falling threshold is the event count above which an event becomes eligible for logging in the alarm log.
5. Enter a value for the rising threshold. The rising threshold is the event count above which an event is logged. Once the count exceeds the rising threshold, one alarm is logged. The switch will not generate another alarm for that event until the count falls below the falling threshold and rises again above the rising threshold.
6. Enter a sample interval in milliseconds. The sample interval defines the period of time in which to count events.
7. Check the **Enable** box to make the alarm eligible for use. Repeat steps 3 through 7 for each alarm you want to configure or enable.
8. Check the **Enable All Alarm Thresholds** box to activate all alarms enabled in step 7.
9. Choose the **OK** button to save all changes.

4.2.2
Exporting Alarm Log Information to a File

To save the switch alarm log to a file, open the faceplate display and do the following:

1. Open the Switch menu and select **Export Alarm Log**.
2. In the Save window, enter a file name.
3. Choose the **Save** button.

4.3
Exporting Name Server Information to a File

To save switch name server information to file, open the topology display and do the following:

1. Open the Switch menu and select **Export Name Server**.
2. In the Save window, enter a file name.
3. Choose the **Save** button.

4.4
Paging a Switch

You can use the beacon feature to page a switch. The beacon feature causes all port Logged-In LEDs to flash, making it easier to recognize. To page a switch, open the Switch menu in the faceplate display and enable the *Toggle Beacon* selection. To cancel the beacon, reselect **Toggle Beacon**.

4.5
Setting the Date and Time

To set the date and time on a switch, do the following:

1. Select a switch in the topology display, and open the faceplate display.
2. Open the Switch menu, and select **Set Date/Time...**.
3. Enter the year, month, day and time in the Switch Date and Time window, then click **OK**. The system will prompt you to reset the switch to implement the new date and time.

4.6
Resetting a Switch

Resetting a switch reboots the switch using configuration parameters in memory. To reset a switch, select the switch to be reset in the fabric tree. Open the Switch menu and select **Reset Switch**.

4.7 Configuring a Switch

Switch configuration is divided into two areas: chassis configuration and network configuration. Chassis configuration specifies switch-wide Fibre Channel settings. Network configuration specifies Ethernet and SNMP settings.

To open the Switch Properties window, open the Switch menu and select **Switch Properties**. You may also right-click a switch graphic in the topology display or faceplate display, and select **Switch Properties** from the popup menu.

4.7.1 Switch Properties

Use the Switch Properties window to change the chassis name, administrative state, domain ID, to enable or disable broadcast support, and to enable or disable inband management. Broadcast support provides support for TCP/IP. The timeout values are displayed for reference purposes when the switch is online; they become active when the switch is taken offline. After making changes, choose the **OK** button to put the new values into effect.

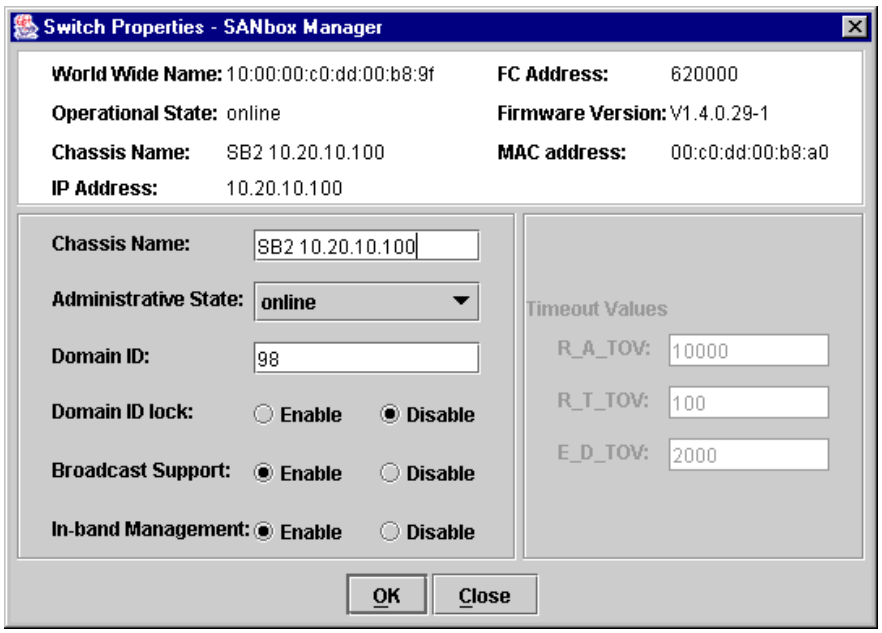


Figure 4-5 Switch Properties Window

4.7.1.1 Chassis Name

A user-defined name of up to 63 characters that identifies the switch.

4.7.1.2
Switch Administrative States

The switch administrative state determines the operational state of the switch and its ports. The switch administrative state exists in two forms: the configured administrative state and the current administrative state.

- The configured administrative state is the state that is saved in the switch configuration and is preserved across switch resets. SANbox Manager always makes changes to the configured administrative state.
- The current administrative state is the state that is applied to the switch for temporary purposes and is not retained across switch resets. The current administrative state is set using the Set Switch command. Refer to the "Set Command" on page A-23.

Table 4-4 describes the administrative state values.

Table 4-4 Switch Administrative States

Parameter	Description
Online	The switch is available
Offline	The switch is unavailable
Diagnostics	The switch is in diagnostics mode and is unavailable.

4.7.1.3
Domain ID and Domain ID Lock

The domain ID is a unique Fibre Channel identifier for the switch. The Fibre Channel address consists of the domain ID, port ID, and the Arbitrated Loop Physical Address (ALPA). The maximum number of switches within a fabric is 239 with each switch having a unique domain ID.

Switches come from the factory with the domain IDs unlocked. This means that if there is a domain ID conflict in the fabric, the switch with the highest principal priority, or the principal switch, will reassign any domain ID conflicts and establish the fabric. If you lock the domain ID on a switch and a domain ID conflict occurs, the switch with the higher WWN will isolate as a separate fabric and the Logged-In LEDs on both switches will flash to show the affected ports. Refer to the "Set Config Command" on page A-25 for information about the switch keyword and the Domain ID Lock and Principal Priority parameters.

If you connect a new switch to an existing fabric with its domain ID unlocked, and a domain conflict occurs, the new switch will isolate as a separate fabric. However, you can remedy this by resetting the new switch or taking it offline then back online. The principal switch will reassign the domain ID and the switch will join the fabric.

Note: Domain ID reassignment is not reflected in zoning that is defined by domain ID and port number pair. You must reconfigure zones that are affected by domain ID reassignment.

4.7.1.4
Broadcast Support

Broadcast is supported on the SANbox2 which allows for TCP/IP support. Broadcast is implemented using the proposed standard specified in *Multi-Switch Broadcast for FC-SW-3, T11 Presentation Number T11/02-031v0*. FSPF is used to setup a fabric spanning tree used in transmission of broadcast frames. Broadcast frames are retransmitted on all ISLs indicated in the spanning tree and all online F/FL_Ports. Broadcast zoning is supported with Access Control List (ACL) and Virtual Private Fabric (VPF) hard zones. When a broadcast frame is received, these hard zones are enforced at the F/FL_Port. If the originator of the broadcast is in a hard zone, the frame is retransmitted on all online F/FL_Ports within the hard zone. If the originator of the broadcast frame is not in a hard zone, the frame is retransmitted on online F/FL_Ports that are not in a hard zone.

4.7.1.5
Inband Management

Inband management is the ability to manage switches across inter-switch links using SANbox Manager, SNMP, IPFC, management server, or the application programming interface. The switch comes from the factory with inband management enabled. If you disable inband management on a particular switch, you can no longer communicate with that switch by means other than a direct Ethernet or serial connection.

4.7.1.6
Timeout Values

The switch timeout values determine the timeout values for all ports on the switch. Table 4-5 describes the switch timeout parameters. The R_A_TOV, R_T_TOV, or E_D_TOV values must be the same for all switches in the fabric.

Note: Timeout values can only be changed if the switch operational state is offline.

Table 4-5 Timeout Values

Parameter	Description
R_A_TOV	Resource Allocation Timeout: Represents the maximum time a frame could be delayed in the Fabric and still be delivered. The default is 10000 milliseconds.
R_T_TOV	Receiver Transmitter Timeout: The amount of time that Sync may be lost between two ports before Link Failure is detected. The default is 100 milliseconds.
E_D_TOV	Error Detect Timeout: Represents the maximum round trip time that an operation between two N_Ports could require. The default is 2000 milliseconds.

4.7.2
Network Properties

Use the Network Properties window shown in Figure 4-6 to change IP and SNMP configuration parameters. After making changes, choose the **OK** button to put the new values into effect. To open the Network Properties window, open the Switch menu and select **Network Properties**.

Note: Since Read Community, Trap Community, and Write Community settings are like passwords, they are write-only fields; the current settings are not displayed.

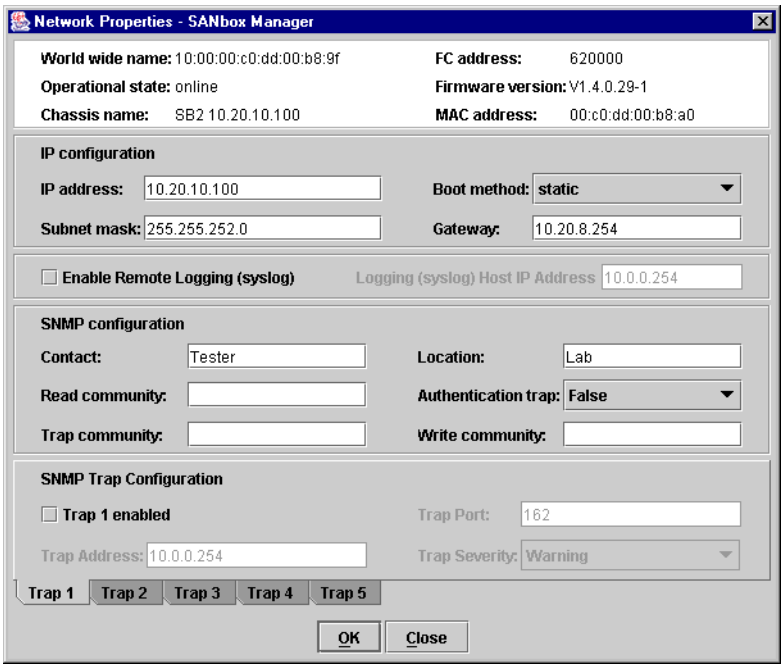


Figure 4-6 Network Properties Window

4.7.2.1
IP Configuration

The IP configuration identifies the switch on the Ethernet network and determines which boot method to use. Table 4-6 describes the IP configuration parameters.

Table 4-6 IP Configuration Parameters

Parameter	Description
IP Address	Internet Protocol (IP) address for the Ethernet port. The default and PROM mode value is 10.0.0.1.
Subnet mask	Subnet mask address for the Ethernet port. The default and PROM mode value is 255.0.0.0.
Boot Method	Choose one of the following methods: ■ Static - Uses the IP configuration parameters entered in the Switch Properties window. ■ BootP - Acquires the IP configuration from a BootP server. ■ RARP (Reverse Address Resolution Protocol) - Acquires the IP address from an RARP server. An RARP request is broadcast with up to three retries, each at 5 second intervals. If no IP address is obtained, the switch reverts to the previously configured IP address. ■ DHCP (Dynamic Host Configuration Protocol) - Acquires the IP configuration from a DHCP server. If no satisfactory lease is obtained, the DHCP client attempts to use the previously configured lease. If the previous lease cannot be used, no IP address will be assigned to this switch in order to avoid an IP address conflict. The DHCP server must then be made available. If a BootP, RARP, or DHCP server is not available, the switch will boot. However, you will be unable to manage the switch through the Ethernet connection. To manage a switch under these circumstances, the connection must be made through the serial port or inband through another switch.
Gateway	IP gateway address. The default and PROM mode value is 10.0.0.254.

4.7.2.2
Remote Logging

The Remote Logging (syslog) feature enables saving of the log information to a remote host that supports the syslog protocol. When enabled, the log entries are sent to the syslog host at the IP address that you specify in the Logging Host IP Address field. Log entries are saved in the internal switch log whether this feature is enabled or not.

To save log information to a remote host, you must edit the syslog.conf file and then restart the syslog daemon. The syslog.conf file on the remote host must contain an entry that specifies the name of the log file in which to save error messages. Add the following line to the syslog.conf file. A <tab> separates the selector field (local0.info) and action field which contains the log file path name (/var/adm/messages/messages.name).

```
local0.info <tab> /var/adm/messages.name
```

4.7.2.3
SNMP Configuration

The SNMP configuration defines how authentication traps are managed. Table 4-7 describes the SNMP configuration parameters.

Table 4-7 SNMP Configuration Parameters

Parameter	Description
Contact	Specifies the name of the person to be contacted to respond to trap events. The default is "undefined".
Read Community	Read Community Authentication. A write-only field of up to 32 characters; the value on the switch and the SNMP management server must be the same. The default value is "Public".
Trap Community	Trap Community Authentication. A write-only field of up to 32 characters; the value on the switch and the SNMP management server must be the same. The default value is "Public".
Location	Specifies the switch location. The default is "undefined".
Authentication Trap	Enables or disables the reporting of SNMP authentication failures. If enabled, a notification trap is sent to the configured trap addresses in the event of an authentication failure if incorrect community string values are used. The default value is "False".
Write Community	Write Community Authentication. A write-only field of up to 32 characters; the value on the switch and the SNMP management server must be the same. The default value is "Private".

4.7.2.4
SNMP Trap Configuration

The SNMP trap configuration defines how traps are set. Table 4-8 describes the SNMP configuration parameters.

Table 4-8 SNMP Trap Configuration Parameters

Parameter	Description
Trap Enabled	Check box to enable or disable the trap.
Trap Address	Specifies the IP address to which SNMP traps are sent. A maximum of 5 trap addresses are supported. The default address for trap 1 is 10.0.0.254. The default address for traps 2–5 is 0.0.0.0.
Trap Port	The port number on which the trap is sent.
Trap Severity	Specifies a severity level to assign to the trap. Open the pull-down menu and choose a level. Traps must be enabled to access this pull-down menu. Trap severity levels include Unknown, Emergency, Alert, Critical, Error, Warning, Notify, Info, Debug, and Mark.

4.7.3
Configuration Backup

Changes made to the switch since it was manufactured can be saved to a file in non-volatile memory. However the backup is lost if the switch is reset. Use the FTP User Images procedures to save the *configdata* file to the workstation. (In FTP, no directory listing is available. The configuration backup file is always named *configdata*.) Refer to the ”Config Command” on page A-7 for information about backing up a configuration.

4.7.4
Configuration Restore

Switch configurations can be “cloned” to easily propagate an identical configuration to other switches. Use the FTP User Images procedures with the Put command to send the previously saved (using config backup) *configdata* file to the switch. Use the Config Restore command to return the switch configuration to the previously saved configuration. The switch is automatically reset upon a successful restore. Refer to the ”Config Command” on page A-7 for information about restoring a configuration.

4.8 Archiving a Switch

You can create an .XML archive file containing the configuration parameters. Archived parameters include the following:

- Switch properties and statistics
- IP configuration
- SNMP configuration
- Port properties and statistics
- Zoning configuration

This archive file can be used to restore the configuration on the same switch or on a replacement switch. You can also use the archive file as a template for configuring new switches to add to a fabric. Security settings and user account information are not archived. The archive can be used later to restore the switch. Refer to ”Restoring a Switch” on page 4-19 for more information.

To archive a switch, do the following:

1. Open the Switch menu and select **Archive**.
2. In the Save window, enter a file name.
3. Choose the **Save** button.

4.9 Restoring a Switch

Restoring a switch loads the archived switch configuration parameters to the switch. The switch configuration must be archived before it can be restored. Furthermore, the switch archive must be compatible with the switch to be restored; that is, you cannot restore a SANbox2-8c switch with a SANbox2-16 archive. Refer to ”Archiving a Switch” on page 4-19 for more information.

To restore a switch, do the following:

1. Log in to the fabric through the switch you want to restore. You cannot restore a switch over an ISL.
2. Open the Switch menu and select **Restore**.
3. In the Restore window, enter the archive file name or browse for the file.
4. Choose the **Restore** button.

4.10 Managing Firmware

The switch memory is partitioned for two firmware images. This can be useful when upgrading so that both the old an new firmware can be maintained on the switch. When you install new firmware, the currently active firmware is preserved and the new firmware becomes the second image or the fallback version. You have the ability to activate either firmware image. If you activate the fallback firmware, the current firmware becomes the fallback version.

4.10.1 Installing Firmware

Installing firmware involves loading the firmware image file on the switch, unpacking the image file, and resetting the switch. SANbox Manager does this in one operation and prompts you to reset the switch to activate the new firmware. To install firmware, do the following:

1. In the faceplate display, open the Switch menu and select **Load Firmware**.
2. In the Firmware Upload window, choose the **Select** button to browse and select the firmware file to be uploaded.
3. Choose the **Start** button to begin the firmware load process.
4. When the loading is complete, choose the **Close** button to close the Firmware Upload window.
5. The application prompts you to reset the switch. Choose the **OK** button to reset the switch and activate the new firmware.

4.10.2 Activating the Fallback Firmware

To activate the fallback firmware, do the following:

1. In the faceplate display, open the Switch menu and select **Firmware Fallback**.
2. The Firmware Fallback window displays the file name of the current firmware and the fallback firmware versions. Choose the **Yes** button to select the fallback firmware or **No** to cancel.
3. The application prompts you to reset the switch. Choose the **OK** button to reset the switch and activate the new fallback firmware.

4.11

Restoring the Factory Default Configuration

You can restore the switch and port configuration settings to the factory default values. To restore the factory configuration on a switch, open the Switch menu and select **Restore Factory Defaults**. Table 4-9 lists the factory default switch configuration settings.

Restoring the switch to the factory default configuration does not restore the account name and password settings. To restore the user accounts, you must select **Reset Password File** option in force PROM mode menu. Refer to *"Recovering a Switch"* in the Installation Guide for your switch.

Table 4-9 Factory Default Configuration Settings

Setting	Value
Chassis name	SANbox2
Administrative state	Online
Domain ID	1
Domain ID Lock	Disable
Inband Management	Enable
Broadcast Support	Enable
Resource Allocation Timeout (RA TOV)	10000 milliseconds
Receiver Transmitter Timeout (RT TOV)	100 milliseconds
Error Detect Timeout (ED TOV)	2000 milliseconds
IP address	10.0.0.1
Subnet mask address	255.0.0.0
Gateway address	10.0.0.254
Boot method	Static
Enable Remote Logging	False
Logging host IP address	10.0.0.254
Contact	Undefined
Location	Undefined
Trap enabled	False
Trap port	162

Table 4-9 Factory Default Configuration Settings (Continued)

Setting	Value
Trap address	Trap 1: 10.0.0.254; Traps 2-5: 0.0.0.0
Trap community	Public
Read community	Public
Write community	Private
Port state	Online
Port speed	Auto-detect
Port mode	GL

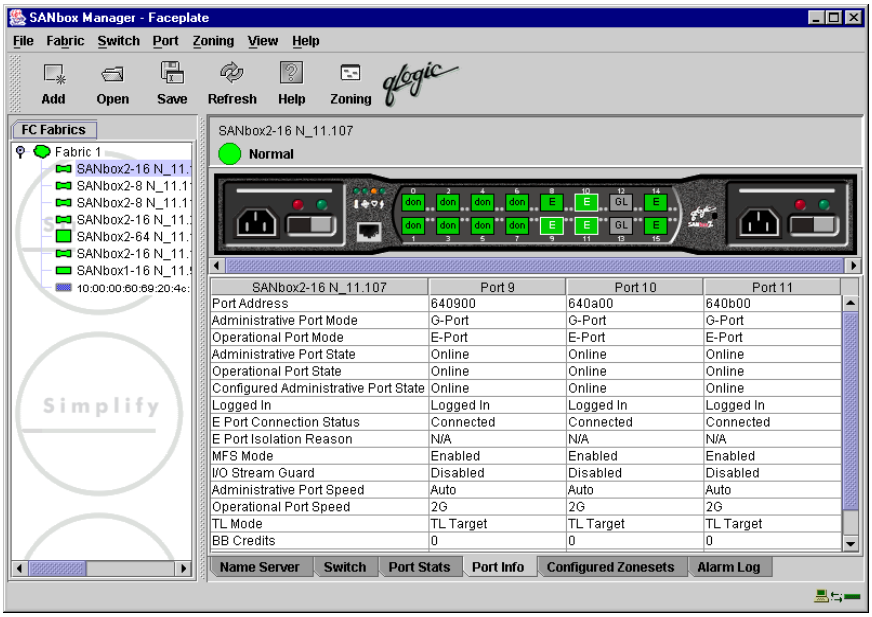
Section 5
Managing Ports

This section describes the following tasks that manage ports and devices:

- Displaying port information
- Configuring ports
- Testing ports

5.1 Displaying Port Information

Port information is available primarily in the faceplate display shown in Figure 5-1. The faceplate display data windows provide information and statistics for switches and ports. Use the topology display to show the status information for links between switches.


SANbox Manager - Faceplate
File Fabric Switch Port Zoning View Help
Add Open Save Refresh Help Zoning
FC Fabrics
Fabric 1
SANbox2-16 N_11.107
Normal
Name Server Switch Port Stats Port Info Configured Zonesets Alarm Log

SANbox2-16 N_11.107	Port 9	Port 10	Port 11
Port Address	640900	640a00	640b00
Administrative Port Mode	G-Port	G-Port	G-Port
Operational Port Mode	E-Port	E-Port	E-Port
Administrative Port State	Online	Online	Online
Operational Port State	Online	Online	Online
Configured Administrative Port State	Online	Online	Online
Logged In	Logged In	Logged In	Logged In
E Port Connection Status	Connected	Connected	Connected
E Port Isolation Reason	N/A	N/A	N/A
MFS Mode	Enabled	Enabled	Enabled
I/O Stream Guard	Disabled	Disabled	Disabled
Administrative Port Speed	Auto	Auto	Auto
Operational Port Speed	2G	2G	2G
TL Mode	TL Target	TL Target	TL Target
BB Credits	0	0	0

Figure 5-1 Faceplate Display - Port Information

5.1.1
Monitoring Port Status

The faceplate display provides the following port related information:

- Port mode
- Port operational state
- Port speed
- Port media

To display port number and status information for a port, position the cursor over a port on the faceplate display. The status information changes depending on the View menu option selected.

5.1.1.1
Displaying Port Modes

To display port mode status, from the faceplate display, open the View menu, and select **View Port Modes**. Table 5-1 lists the possible port modes and their meanings.

Table 5-1 Port Modes

Mode	Description
F	Fabric port
FL	Fabric loop port
TL	Translated loop port
G	Generic port
GL	Generic fabric loop port
E	Expansion port
D	Donor port

5.1.1.2
Displaying Port Operational States

To display the operational state on each port in the faceplate display, open the View menu and select **View Port States**. Table 5-2 lists the possible operational states and their meanings. The port operational state refers to actual port state and not the administrative state you may have assigned.

Table 5-2 Port Operational States

State	Description
On	Online – port is active and ready to send data.
Ia	Inactive – port operational state is offline, but administrative state is online.
Off	Offline – port is active, can receive signal, but cannot accept a device login.
Tst	Diagnostics – port is in diagnostics mode in preparation for testing
Dn	Down – the port is inactive or shut off, not receiving a signal, and can't be logged in.

5.1.1.3
Displaying Port Speeds

To display the speed of each port in the faceplate display, open the View menu and select **View Port Speeds**. Table 5-3 lists the possible speeds.

Table 5-3 Port Speeds

State	Description
1Gb	1 Gbps transmission speed.
2Gb	2 Gbps transmission speed.

5.1.1.4
Displaying Tranceiver Media Status

To display transceiver media status, open the View menu and select **View Port Media**. Table 5-2 lists the possible media states and their meanings.

Table 5-4 Transceiver Media View

Media Icon	Description
	Optical SFP, Online (Green)
	Optical SFP, Offline (Gray)
None	Empty port, no transceiver installed

5.1.2
Port Statistics Data Window

The Port Statistics data window displays statistics about port performance. To open the Port Statistics window, select one or more ports in the faceplate display and choose the **Port Statistics** tab below the data window. Table 5-5 describes the Port Statistics data window entries.

The Statistics pull-down menu is available on the Port Statistics data window, and provides different ways to view detailed port information. Choose the down arrow to open the pull-down menu. Open the pull-down menu and select **Absolute** to view the total count of statistics since the last switch reset. Select **Rate** to view the number of statistics counted per second over the polling period. Select **Baseline** to view the total count of statistics since the last time the baseline was set. When viewing baseline statistics, choose the **Clear Baseline** button to set the current baseline.

Table 5-5 Port Statistics Data Window Entries

Entry	Description
Start Time	The beginning of the period over which the statistics apply. The start time for the Absolute view is not applicable. The start time for the Rate view is the beginning of polling interval. The start time for the Baseline view is the last time the baseline was set.
End Time	The last time the statistics were updated on the display.
Total Time	Total time period from start time to end time.
Login Count	Number of logins that have occurred on the switch.

Table 5-5 Port Statistics Data Window Entries (Continued)

Entry	Description
Logout Count	Number of logouts that have occurred on the switch.
Al Init Count	Number of times the port entered the initialization state.
Invalid Destination Address	Number of address identifiers (S_ID, D_ID) found to be in error.
Total LIP Received	Number of loop initialization primative frames received.
LIP F7F7 Count	A loop initialization primative frame used to acquire an AL_PA.
LIP F8F7 Count	Currently not used.
LIP F7AIPs Count	This LIP is used to reinitialize the loop. An L_port, identified by AL_PS, may have noticed a performance degradation and is trying to restore the loop.
LIP F8AIPs Count	This LIP denotes a loop failure detected by the L_port identified by AL_PS.
LIP AIPdAIPs Count	Number of F7, AL_PS LIPs, or AL_PD (vendor specific) resets, performed.
Class 2 In Frames	Number of class 2 frames received by this port.
Class 2 Out Frames	Number of class 2 frames transmitted by this port.
Class 2 Words In	Number of class 2 words received by this port.
Class 2 Words Out	Number of class 2 words transmitted by this port.
Class 3 In Frames	Number of class 3 frames received by this port.
Class 3 Out Frames	Number of class 3 frames transmitted by this port.
Class 3 Words In	Number of class 3 words received by this port.
Class 3 Words Out	Number of class 3 words transmitted by this port.
Decode Error Count	Number of invalid transmission words detected during decoding. Decoding is from the 10-bit characters and special K characters.
Loss Of Sync Count	Number of synchronization losses (>100 ms) detected by this port. A loss of synchronization is detected by receipt of an invalid transmission word.
Invalid CRC Count	Number of invalid Cyclic Redundancy Check (CRC) frames detected.
Tx Wait Count	Number of times the port entered a wait state because it was out of buffer-to-buffer credits.

Table 5-5 Port Statistics Data Window Entries (Continued)

Entry	Description
Class 3 Toss Count	Number of class 2 and class 3 sequences that were discarded by this port. A sequence can be discarded because of detection of a missing frame (based on SEQ_CNT), detection of an E_D_TOV timeout, receiving a reject frame, receiving frames for a stopped sequence, or other causes.
FReject Count	Number of frames, from devices, that have been rejected. Frames can be rejected for any of a large number of reasons.
FBusy Count	Number of class 2 and class 3 fabric busy (F_BSY) frames generated by this port in response to incoming frames. This usually indicates a busy condition on the fabric or N_port that is preventing delivery of this frame.
Link Failures	Number of optical link failures detected by this port. A link failure is a loss of synchronization for a period of time greater than the value of R_T_TOV or by loss of signal while not in the offline state. A loss of signal causes the switch to attempt to re-establish the link. If the link is not re-established by the time specified by R_T_TOV, a link failure is counted. A link reset is performed after a link failure.
Primitive Sequence Errors	Number of bad primitives received by the port.
Rx Link Resets	Number of link reset primatives received from an attached device.
Tx Link Resets	Number of link reset primatives sent from this port to an attached port.
Rx Offline Sequences	Number of offline sequence primitives received by the port.
Tx Offline Sequences	Number of offline primitives transmitted by the port.
Total Errors	Total number of primitive and non-primitive port link errors.
Total Tx Frames	Total number of frames transmitted by the port.
Total Rx Frames	Total number of frames received by the port.
Total Tx Words	Total number of words transmitted by the port.
Total Rx Words	Total number of words received by the port.
Total Link Resets	Number of link-reset primitives the transmitted by the port.
Total Offline Sequences	Total number of offline sequences transmitted and received by the port.

5.1.3
Port Information Data Window

The Port Information data window displays port detail information for the selected port. To open the Port Information data window, choose the **Port Info** tab below the data window in the faceplate display.

Table 5-6 Port Information Data Window Entries

Entry	Description
Port Address	Port Fibre Channel address.
Admin Port Mode	The port mode before auto-configuration occurs.
Oper Port Mode	The current port mode.
Admin Port State	Current port administrative state.
Oper Port State	Port operational state: online, offline, diagnostics, or down.
Configured Admin Port State	Port administrative state that is stored in the switch configuration.
Logged In	Indicates whether logged in or not.
E Port Connection Status	Whether E_Port connection is enabled.
E Port Isolation Reason	Why E_Port is isolated.
MFS Mode	Port tuning indicator.
I/O Stream Guard	Whether RSCN suppression is enabled or disabled.
Admin Port Speed	The speed requested by the user.
Oper Port Speed	The speed actually being used by the port.
TLMode	Indicates if TL target or TL initiator is being used.
BB Credits	Whether buffer-to-buffer credits have been set.
Ext Credits Requested	Whether extended credits have been requested for ports.
Medium	The transceiver type.

5.1.4
Name Server Data Window

The Name Server data window displays information about the port and the connected device. To open the Name Server data window, select one or more switches in the topology display and choose the **Name Server** tab below the data window. You can also open the Name Server data window in the faceplate display. Refer to Table 4-1 for a description of the Name Server data window entries.

5.2
Configuring Ports

The port settings or characteristics are configured using the Port Properties window shown in Figure 5-2. To open the Port Properties window, select one or more ports, open the Port menu and select **Port Properties**.

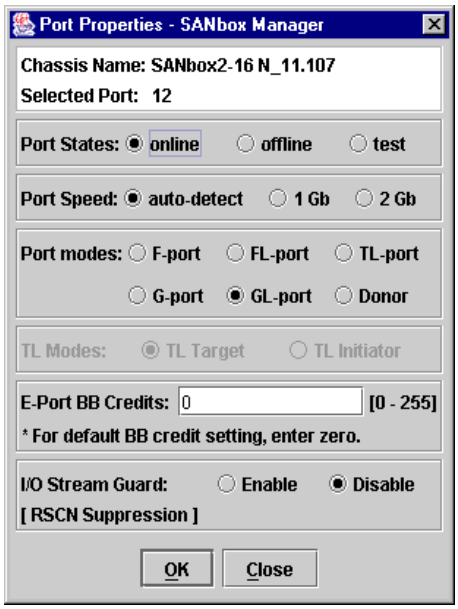

Port Properties - SANbox Manager
Chassis Name: SANbox2-16 N_11.107
Selected Port: 12
Port States: online offline test
Port Speed: auto-detect 1 Gb 2 Gb
Port modes: F-port FL-port TL-port
G-port GL-port Donor
TL Modes: TL Target TL Initiator
E-Port BB Credits: 0 [0 - 255]
* For default BB credit setting, enter zero.
I/O Stream Guard: Enable Disable
[RSCN Suppression]
OK
Close

Figure 5-2 Port Properties Window

The Port Properties window displays the switch name and the selected port(s). Use the Port Properties window to change the following parameters:

- Port state
- Port speed
- Port mode
- TL mode
- Port buffer credits
- I/O Stream Guard (RSCN Suppression)

5.2.1
Changing Port Administrative States

The port administrative state determines the operational state of a port. The port administrative state exists in two forms: the configured administrative state and the current administrative state.

- The configured administrative state is the state that is saved in the switch configuration and is preserved across switch resets. SANbox Manager always makes changes to the configured administrative state.
- The current administrative state is the state that is applied to the port for temporary purposes and is not preserved across switch resets. The current administrative state is set using the Set Port command. "Set Port Command" on page A-36.

Table 5-7 describes the port administrative states. To change port administrative state, do the following:

1. Select one or more ports in the faceplate display.
2. Open the Port menu and select **Port Properties** to open the Port Properties window.
3. Choose the **Port States** radio button that corresponds to the port state you want.
4. Choose the **OK** button to write the new port state to the switch.

Table 5-7 Port Administrative States

State	Description
Online	Activates and prepares port to send data.
Offline	Prevents port from receiving signal and accepting a device login.
Diagnostics	Prepares port for testing and prevents the port from accepting a device login.

5.2.2
Changing Port Speeds

The SANbox2 switch ports are capable of transmitting and receiving at 1 or 2 Gbps. The ports can be configured for either transmission speed or to sense the transmission speed of the device to which it is connected. Table 5-8 describes the port speeds. To change the port speed, do the following:

1. Select one or more ports in the faceplate display.
2. Open the Port menu and select **Port Properties**.
3. Choose the radio button that corresponds to the port speed you want.

4. Choose the **Apply** button to write the new port speed to the switch.

Table 5-8 Port Speeds

State	Description
Auto-Detect	Matches the transmission speed of the connected device. This is the default.
1Gb	Sets the transmission speed to 1 Gbps.
2Gb	Sets the transmission speed to 2 Gbps.

5.2.3

Changing Port Modes

The SANbox2 switch ports support both public and private devices as single devices or in loops. The ports can be configured to self-discover the proper mode to match the device or switch to which it is connected. Table 5-9 describes the port modes. To change the port mode, do the following:

1. Select one or more ports in the faceplate display.
2. Open the Port menu and select **Port Properties** to open the Port Properties window.
3. Choose the **Port Modes** radio button that corresponds to the port mode you want.
4. Choose the **OK** button to write the new port mode to the switch.

Table 5-9 Port Modes

State	Description
F_Port	Fabric port - Supports a single public device (N_Port).
FL_Port	Fabric loop port - Supports a loop of up to 126 public devices (NL_Port).
TL_Port	Translated loop port - Supports a loop of up to 124 private target or 125 private initiator devices capable of communicating with up to 63 off-loop initiator devices or 64 off-loop target devices. Refer to the SANbox2-8c or SANbox2-16 Installation Guide for more information about TL_Ports.
G_Port	Generic port - Self discovers as an F_Port or an E_Port.
GL_Port	Generic loop port - Self discovers as an F_Port, FL_Port, or an E_Port. GL_Port is the default port mode. A single device on a public loop will attempt to configure as an F_Port first, then if that fails, as an FL_Port.
Donor	Donor port - Allows buffer credits to used by another port.

5.2.4
Changing TL Modes

You can configure a TL_Port to support a loop of private target devices or a loop of private initiator devices.

- For a loop of up to 124 private target devices, choose the **TL Target** radio button. This enables up to 63 initiator devices anywhere in the fabric to automatically connect with the private devices on the TL_Port. Group the TL_Port and up to 63 initiators in the same soft or ACL zone using worldwide name or domain ID and port ID membership to limit the number of possible initiators to 63.
- For a loop of up to 125 private initiator devices, choose the **TL Initiator** radio button. This enables the private initiators on the TL_Port to automatically connect to up to 64 target and initiator devices in the same soft or ACL zone. You must group the TL_Port and the target devices in the same soft or ACL zone using worldwide name or domain ID and port ID membership. If there are more than 65 members in the zone, the TL_Port will be unable to communicate with the fabric.

5.2.5
Changing Buffer-to-Buffer Credits

Each port has a receive buffer capacity of 12 Fibre Channel frames or credits which is equal to approximately 24K bytes. Port buffer credits can be changed on ports to allow connections to non-QLogic switches that have different port buffer capacities. To change port buffer credits, do the following:

1. Select one or more ports in the faceplate display.
2. Open the Port menu and select **Port Properties**.
3. In the **E_Port BB Credits** field, enter the new number in the range from 0–255.
4. Choose the **OK** button to write the new buffer-to-buffer setting to the switch.

5.2.6
I/O Stream Guard

The I/O Stream Guard feature suppresses Registered State Control Notification (RSCN) messages on a port basis.

5.2.7
Extending Port Credits

Each port is supported by a data buffer with a 12 credit capacity; that is, 12 maximum sized frames. For fibre optic cables, this enables full bandwidth service over a distance of 20 kilometers at 1 Gbps (0.6 credits/Km), or 10 kilometers at 2 Gbps (1.2 credits/Km). Longer distances can be spanned at full bandwidth by borrowing credits from designated donor ports thus pooling the buffer capacities.

This is called credit extension. Each donor port contributes 11 credits to the pool from which the recipient ports can draw. For example, one donor port contributes 11 credits to the pool from which a recipient draws for a total of 23 credits (11+12). This provides approximately 38 Km at 1 Gbps (23÷0.6) or 19 Km at 2 Gbps (23÷1.2).

To extend port buffer credits, do the following:

1. In the faceplate display, select the ports that are to serve as donor ports. Open the Port menu and select **Port Properties**. In the Port Properties window, choose the **Donor** radio button and choose **OK**.

   Note: Donor ports are incapable of transmitting or receiving data.

2. In the faceplate display, select the recipient ports. Recipient ports must be configured as G_Ports or F_Ports. Open the Port menu and select **Extended Credits**. This opens the Extended Credits window shown in Figure 5-3.
3. Distribute the borrowed credits by incrementing the **Ext Credits Requested** field for the recipient ports up to the total credits in the pool. Choose **OK**. If you exceed this total, a message will be entered in the alarm log indicating that some recipient ports did not receive the requested credits.

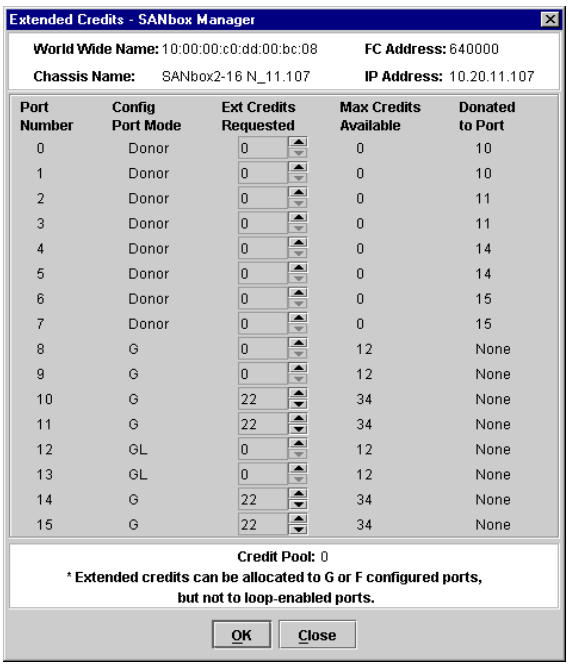

Extended Credits - SANbox Manager
World Wide Name: 10:00:00:c0:dd:00:bc:08
FC Address: 640000
Chassis Name: SANbox2-16 N_11.107
IP Address: 10.20.11.107
Port Number
Config Port Mode
Ext Credits Requested
Max Credits Available
Donated to Port
0 Donor 0 0 10
1 Donor 0 0 10
2 Donor 0 0 11
3 Donor 0 0 11
4 Donor 0 0 14
5 Donor 0 0 14
6 Donor 0 0 15
7 Donor 0 0 15
8 G 0 12 None
9 G 0 12 None
10 G 22 34 None
11 G 22 34 None
12 GL 0 12 None
13 GL 0 12 None
14 G 22 34 None
15 G 22 34 None
Credit Pool: 0
* Extended credits can be allocated to G or F configured ports, but not to loop-enabled ports.
OK
Close

Figure 5-3 Extended Credits Window

4. To confirm that the requested credits were received, reopen the Extended Credits window and match the number of credits in the "Ext Credits Requested" column with the number in the "Donated to Port" column.

Note: As credits are used, the Logged-In LEDs on the corresponding donor ports illuminate continuously. In addition, donor port Activity LEDs will reflect the same traffic as the recipient port. Donor ports whose credits are being used are unavailable to devices that are connected to them.

5.2.8 Resetting a Port

The Reset Port option reinitializes the port using configuration parameters in memory. To reset a port, do the following:

1. In the Faceplate Display, select the port(s) to be reset.
2. Open the Port menu and select **Reset Port**.

5.3 Testing Ports

The port loopback tests verify correct port operation by sending a frame out through the loop, and then verifying that the frame received matches the frame that was sent. Only one port can be tested at a time for each type of test. The Port Loopback Test window shown in Figure 5-4 presents the following tests:

- **SerDes level (Internal)** - The SerDes level test verifies port circuitry. The SerDes level test sends a test frame from the ASIC through the SerDes chip and back to the ASIC for the selected ports. The port passes the test if the frame that was sent by the ASIC matches the test frame that was received.
- **SFP level (External)** - The SFP level test also verifies port circuitry. The SFP level test sends a test frame from the ASIC through the SerDes chip, through the SFP transceiver fitted with a loopback plug, and back to the ASIC for the selected ports. The port passes the test if the test frame that was sent by the ASIC matches the test frame that was received.
- **Node-to-Node (Online)** - The Node-to-Node test verifies communications between the port and its device node or device loop. The port being tested must be online and connected to a remote device. The port passes the test if the frame that was sent by the ASIC matches the frame that was received.

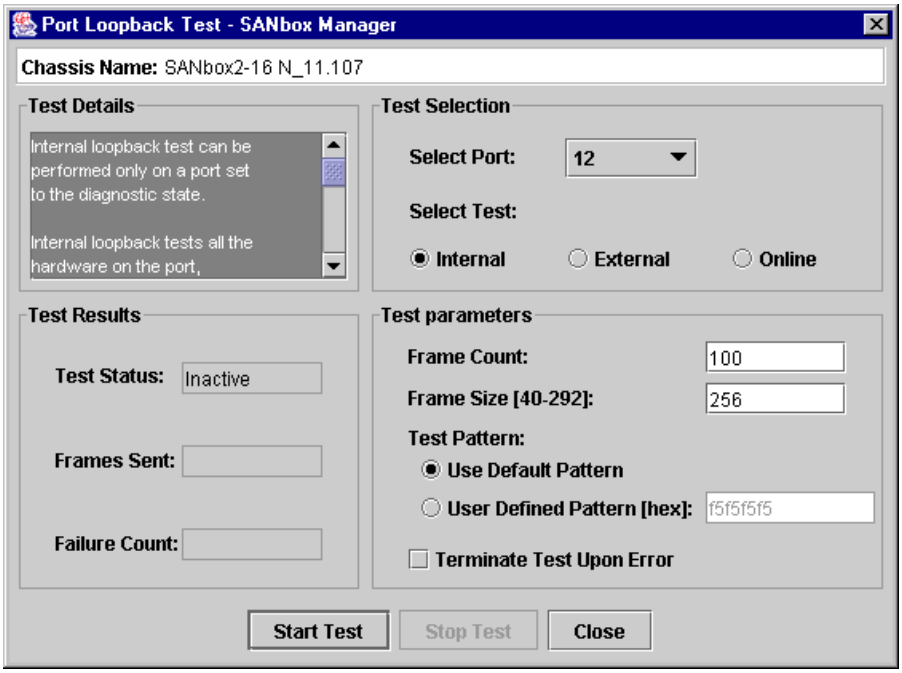


Figure 5-4 Port Loopback Test Window

Note: The SerDes (Internal) and SFP (External) level tests disrupt communication on the selected port. The Node-to-Node (Online) level test does not disrupt communication, because the requires that the port be online.

To run the internal, external, or online port loopback test on a port, do the following:

1. In the faceplate display, select the port to be tested.
2. Open the Port menu and select **Port Loopback Test** to open the Port Loopback Test window.
3. In the Test Selection area, choose the radio button for the type of loopback test to be run (Internal, External, or Online). If you choose the internal or external test, SANbox Manager will prompt you to confirm that the port state needs to be changed to the diagnostic state. Choose the **OK** button and SANbox Manager will change the port state.
4. Enter the frame count, frame size, and choose a test pattern radio button. You may use the default pattern or enter an 8-digit pattern (hex). For online test, you can select the **Terminate Test Upon Error** check box if you want the test to stop should it encounter an error.

5. Choose the **Start Test** button to begin the test. The Test Results area displays the test status, number of frames sent, and number of errors found.
6. To test another port, open the Select Port pull-down menu and select another port (number) and test type (Internal, External, or Online) in the Test Selection area.
7. Choose the **Start Test** button to begin the next test. Observe the results in the Test Results area.

Notes

Appendix A
Command Line Interface

Each switch contains a Telnet server. This server allows a Telnet client to establish a Telnet session with the switch to retrieve information or to configure parameters using the Command Line Interface (CLI). The CLI enables you to perform a variety of fabric and switch management tasks through an Ethernet or a serial port connection.

A.1 Logging On to a Switch

To log on to a switch using Telnet, open a command line window on the management workstation and enter the Telnet command followed by the switch IP address:

```
/> telnet 123.45.67.890
```

A Telnet window opens prompting you for a login. Enter an account name and password. Switches come from the factory with the following user account already defined:

Account name: admin
Password: password
Authority: Admin

This user account provides full access to the switch and its configuration. After planning your fabric management needs and creating your own user accounts, consider changing the password for this account. Refer to ”Commands” on page A-3 for more information about authority levels. Refer to the ”User Command” on page A-69 for information about creating user accounts.

Note: A switch supports a combined maximum of 15 logins. This includes SANbox Manager inband and out-of-band logins, Telnet out-of-band logins, and SNMP out-of-band logins. Of this 15, there can be a maximum of 10 SANbox Manager logins. Additional logins will be refused.

A.2 Command Syntax

The command syntax is as follows:

command
keyword
keyword *[value]*
keyword [value1] [value2]

The **Command** is followed by one or more keywords. Consider the following rules and conventions:

- Commands and keywords are lowercase and case sensitive.
- Commands with keywords require one of those keywords.
- Required keyword values appear in standard font: [value]. Optional values are shown in italics: *[value].*
- Underlined portions of the keyword in the command format indicate the abbreviated form that can be used. For example the Delete keyword can be abbreviated Del.

A.3 Commands

The command set provides for User and Admin authority levels.

- User authority grants viewing access to the fabric and switches using the Show command and other read-only commands.
- Admin authority includes the User authority and grants permission to use the Admin command. The Admin Start command opens an admin session which provides access to the commands that change switch and fabric configurations. Refer to the "Admin Command" on page A-4.

Note: Admin authority is enforced only if fabric security is enabled. By default, fabric security is disabled. Refer to "Set Setup Command" on page A-37 (System keyword) for more about setting fabric security.

The commands and their page numbers are listed by authority level in Table A-1.

Table A-1 Commands Listed by Authority Level

User Authority Commands		Admin Authority Command	
Help	(A-11)	Admin	(A-4)
History	(A-12)	**Admin Session Commands**	
Ps	(A-16)		
Quit	(A-17)	Alias[1]	(A-5)
Show	(A-41)	Config[1]	(A-7)
Show Config	(A-54)	Date[1]	(A-9)
Show Log	(A-57)	Fallback	(A-10)
Show Perf	(A-59)	Image	(A-13)
Show Setup	(A-61)	Lip	(A-14)
Uptime	(A-68)	Passwd	(A-15)
Whoami	(A-71)	Reset	(A-18)
		Set[1]	(A-23)
		Set Config	(A-25)
		Set Log	(A-33)
		Set Port	(A-36)
		Set Setup	(A-37)
		Shutdown	(A-64)
		Test	(A-65)
		User[1]	(A-69)
		Zone[1]	(A-72)
		Zoneset[1]	(A-76)
		Zoning[1]	(A-79)

[1]Some keywords are available with User authority.

Admin Command

Opens and closes an Admin session. The Admin session provides commands that change the fabric and switch configurations. Only one Admin session can be open on the switch at any time. An inactive Admin session will time out after a period of time which can be changed using the Set Setup System command. Refer to the Set Setup Command on page A-37.

Authority Admin

Syntax

admin
start
end
cancel

Keywords

start
Opens the admin session.

end
Closes the admin session. The Logout, Shutdown, and Reset Switch commands will also end an admin session.

cancel
Terminates an Admin session opened by another user. Use this keyword with care because it terminates the Admin session without warning the other user and without saving pending changes.

Notes Closing a Telnet window during an admin session does not release the session. In this case, you must either wait for the admin session to time out, or use the Admin Cancel command.

Examples The following example shows how to open and close an Admin session:

```
SANbox2 #> admin start

SANbox2  (admin) #>

.
.
.

SANbox2  (admin) #> admin end
SANbox2  #>
```

Alias Command

Creates a named set of ports. Aliases make it easier to assign a set of ports to many zones. An alias can not have a zone or another alias as a member.

Authority Admin

Syntax **alias**

add [alias] [members]
copy [alias_source] [alias_destination]
create [alias]
delete [alias]
list
members [alias]
remove [alias] [members]
rename [alias_old] [alias_new]

Keywords **add [alias] [members]**

Specifies one or more ports given by [members] to add to the alias named [alias]. An alias can have a maximum of 2000 members. [members] can have one of the following formats:

- Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.
- 6-character hexadecimal device Fibre Channel address (hex)
- 16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.

The application verifies that the [alias] format is correct, but does not validate that such a port exists.

copy [alias_source] [alias_destination]

Creates a new alias named [alias_destination] and copies the membership into it from the alias given by [alias_source].

create [alias]

Creates an alias with the name given by [alias]. An alias name must begin with a letter and be no longer than 64 characters. Valid characters are 0-9, A-Z, a-z, &, _, and -. The zoning database supports a maximum of 256 aliases.

delete [alias]

Deletes the specified alias given by [alias] from the zoning database. If the alias is a member of the active zone set, the alias will not be removed from the active zone set until the active zone set is deactivated.

list

Displays a list of all aliases. This keyword is valid for User authority and does not require a zoning edit session or an admin session.

members [alias]
Displays all members of the alias given by [alias]. This keyword is available with User authority and does not require a zoning edit session or an admin session.

remove [alias] [members]
Removes the ports given by [members] from the alias given by [alias]. [members] can have one of the following formats:

- Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.
- 6-character hexadecimal device Fibre Channel address (hex)
- 16-character hexadecimal worldwide port name (WWPN) for the device with the format xx:xx:xx:xx:xx:xx:xx:xx.

rename [alias_old] [alias_new]
Renames the alias given by [alias_old] to the alias given by [alias_new].

Config Command

Manages the Fibre Channel configurations on a switch. For information about setting the port and switch configurations, refer to the Set Config Command on page A-25.

Authority Admin for all keywords except List

Syntax

config
activate *[config]*
backup
cancel
copy [config_source] [config_destination]
delete [config]
edit *[config]*
list
restore
save *[config]*

Keywords

activate *[config]*
Activates the configuration given by [config]. If you omit the configuration, the currently active configuration is used. Only one configuration can be active at a time.

backup
Creates a file named *configdata*, which contains the system configuration information. To download this file, open an FTP session, log in with account name/password of “images” for both, and type “get configdata”.

cancel
Terminates the current configuration edit session without saving changes that were made.

copy [config_source] [config_destination]
Copies the configuration given by [config_source] to the configuration given by [config_destination]. The switch supports up to 10 configurations including the default configuration.

delete [config]
Deletes the specified configuration file where [config] is a file name.

edit *[config]*
Opens an edit session for the configuration given by [config]. If you omit the configuration name, the currently active configuration is used.

list
Displays a list of all available configurations. This keyword is available with User authority.

restore
Restores configuration settings to an out-of-band switch from a backup file named *configdata*, which must be first uploaded on the switch using FTP. You create the backup file using the Config Backup command. Use FTP to load the backup file on a switch, then enter the Config Restore command.

save *[config]*
Saves changes made during a configuration edit session in the configuration given by [config]. If you omit the configuration name value, the configuration you chose for the Config Edit command is used. The switch supports up to 10 configurations including the default configuration.

Notes

If you edit the active configuration, changes will be held in suspense until you reactivate the configuration or activate another configuration.

Examples

The following shows an example of how to open and close a Config Edit session:

```
SANbox2 #> admin start

SANbox2 (admin) #> config edit
.
.
.
SANbox2 (admin-config) #> config cancel

  Configuration mode will be canceled.Please confirm (y/n): [n] y

SANbox2 (admin) #> admin end
```

Date Command

This command displays or sets the system date and time. To set the date and time the information string must be provided in this format: MMDDhhmmCCYY. You must reset the switch for the new date to take effect.

Authority Admin to change the date; User to display the date.

Syntax **date**
[MMDDhhmmCCYY]

Keywords ***[MMDDhhmmCCYY]***
Specifies the date – this requires an admin session. If you omit [MMDDhhmmCCYY], the current date is displayed – this is available with User authority.

Examples The following is an example of the Date command:

```
SANbox2 #> date
  Tue Nov 12 07:51:24 2002
```

Fallback Command

Loads the fallback version of the firmware from switch memory. The switch stores two versions of the firmware. This command alternately activates the two versions.

Authority Admin

Syntax **fallback**

Notes

- The Show Switch command displays the available firmware versions and the currently active version.
- After executing the Fallback command, reset the switch for the firmware to be placed in effect.

Examples The following is an example of the Fallback command:

```
SANbox2 #> admin start

SANbox2 (admin) #> fallback

  Reverting to previous software image.  Please confirm (y/n): [n] y

SANbox2 #> admin end
```

Help Command

Displays a brief description of the specified command and its keywords.

Authority User

Syntax **help *[command] [keyword]***

Keywords ***[command]***
A command name. If you omit this value, the system displays all available commands from which to choose.

[keyword]
A keyword associated with the command named by [command]. If you omit this value, the system displays the available keywords for the specified command.

all
Displays a list of all available commands (including command variations).

Examples The following is an example of the Help Set command:

```
SANbox2 #> help set

set SET_OPTIONS
There are many attributes that can be set.
Type help with one of the following to get more information:
    set alarm
    set beacon
    set blade
    set config blade
    set config port
    set config ports
    set config switch
    set config threshold
    set config zoning
    set log
    set pagebreak
    set port
    set setup snmp
    set setup system
    set switch
```

The following is an example of the Help Set Beacon command:

```
SANbox2 #> help set beacon
set beacon On | Off
This command allows the lights on the front of the switch to flash.
The On option will start and the Off option will stop the flashing.
```

History Command

Displays a numbered list of the previously entered commands from which you can re-execute selected commands.

Authority User

Syntax **history**

Notes Use the History command to provide context for the ! command:

- Enter ![command] to re-enter the most recent execution of that command.
- Enter ![line number] to re-execute the corresponding command from the History display
- Enter ![partial command string] to re-execute a command that matches the command string.
- Enter !! to re-execute the most recent command.

Examples The following is an example of the History command:

```
SANbox2 #> history
   1 show switch
   2 date
   3 help set
   4 history

SANbox2 #> !3
help set

set SET_OPTIONS
There are many attributes that can be set.
Type help with one of the following to get more information:
    set alarm
    set beacon
    set blade
    set config blade
    set config port
    set config ports
    set config switch
    set config threshold
    set config zoning
    set log
    set pagebreak
    set port
    set setup snmp
    set setup system
    set switch
```

Image Command

Manages and installs switch firmware.

Authority Admin

Syntax **image**

cleanup
fetch [account_name] [ip_address] [file_source] [file_destination]
list
unpack [file]

Keywords **cleanup**

Removes all firmware image files from the switch. All firmware image files are removed automatically each time the switch is reset.

fetch [account_name] [ip_address] [file_source] [file_destination]

Retrieves image file given by [file_source] and stores it on the switch with the file name given by [file_destination]. The image file is retrieved from the device with the IP address given by [ip_address] and an account name given by [account_name]. If an account name needs a password to access the device, the system will prompt you for it.

list

Displays the list of image files that reside on the switch.

unpack [file]

Installs the firmware file given by [file]. After unpacking the file, a message appears confirming successful unpacking. The switch must be reset for the new firmware to take effect.

Lip Command

Reinitializes the specified loop port.

Authority Admin

Syntax **lip [port_number]**

Keywords **[port_number]**
The number of the port to be reinitialized.

Examples The following is an example of the Lip command:

```
SANbox2  (admin) #> lip 2
```

Passwd Command

Changes a user account's password.

Authority Admin to change another account's password; User to change your own.

Syntax **passwd [account_name]**

Keywords **[account_name]**
The user account name. You must open an admin session to change the password for an account name other than your own. If you omit [account_name], you will be prompted to change the password for the current account name.

Examples The following is an example of the Passwd command:

```
SANbox2  (admin) #> passwd user2

     Press 'q' and the ENTER key to abort this command.

  account OLD password               :
  account NEW password (4-20 chars)  :

  please confirm account NEW password:

  password has been changed.
```

Ps Command

Displays current system process information.

Authority User

Syntax **ps**

Examples The following is an example of the Ps command:

```
SANbox2 #> ps
PID  PPID %CPU     TIME     ELAPSED COMMAND
298   292  0.0 00:00:00 59:42       cns
299   292  0.0 00:00:00 59:42       ens
300   292  0.0 00:00:00 59:42       dlog
301   292  0.3 00:00:53 59:42       ds
302   292  0.2 00:00:29 59:42       mgmtApp
303   292  0.0 00:00:02 59:42       nserver
304   292  0.0 00:00:00 59:42       mserver
305   292  0.1 00:00:15 59:42       util
306   292  0.0 00:00:04 59:42       eport
307   292  1.2 00:02:53 59:41       PortApp
308   292  0.0 00:00:01 59:41       zoning
309   292  0.0 00:00:00 59:41       diagApp
```

Quit Command

Closes the Telnet session.

Authority User

Syntax **quit, exit, or logout**

Reset Command

Resets the switch and port configuration parameters.

Authority Admin

Syntax **reset**

config *[config_name]*
factory
port [port_number]
snmp
switch (default)
system
zoning

Keywords

config *[config_name]*
Resets the configuration given by [config_name] to the factory default values for switch, port, alarm threshold, and zoning configuration. This keyword clears all zoning definitions. If [config_name] does not exist on the switch, a configuration with that name will be created. If you omit [config_name], the active configuration is reset. You must activate the configuration or reset the switch for the changes to take effect. Refer to Table A-2 through Table A-4 for switch, port, and alarm threshold configuration default values.

factory
Resets switch, alarm threshold, zoning, SNMP, zoning configuration, and system configuration settings to the factory default values. The switch configuration is activated automatically. Refer to Table A-2 through Table A-6.

port [port_number]
Reinitializes the port given by [port_number]. Ports are numbered beginning with 0.

snmp
Resets the SNMP configuration settings to the factory default values. Refer to Table A-5 for SNMP configuration default values.

switch
Reinitializes the switch. This is the default. This command also closes the Telnet session.

system
Resets the system configuration settings to the factory default values. Refer to Table A-6 for system configuration default values.

zoning
Clears the zoning database and deactivates the active zone set. The zoning configuration values (autosave, default visibility) remain unchanged.

Notes The following tables specify the various factory default settings:

Table A-2. Switch Configuration Defaults

Parameter	Default
Admin State	Online
Broadcast Enable	True
InbandEnable	True
Domain ID	1
Domain ID Lock	False
Symbolic Name	SANbox2
R_T_TOV	100
R_A_TOV	10000
E_D_TOV	2000
FS_TOV	5000
DS_TOV	5000
Principal Priority	254
System Description	Undefined
Configuration Last Saved By	Initial
Configuration Last Saved On	Initial

Table A-3. Port Configuration Defaults

Parameter	Default
Admin State	Online
Link Speed	Auto
Port Type	GL
TL_Port Mode	TLTargetMode
ISL Security	Any
Symbolic Name	Port
ALFairness	False
ARB_FF	False
InteropCredit	0

Table A-3. Port Configuration Defaults (Continued)

Parameter	Default
ExtCredit	0
FanEnable	True
LCFEnable	False
MFSEnable	True
MFS_TOV	10
MSEnable	True
NoClose	False
IOStreamGuard	False
VIEnable	False
CheckAlps	False

Table A-4. Alarm Threshold Configuration Defaults

Parameter	Default
ThresholdMonitoringEnabled	True
CRCErrorsMonitoringEnabled RisingTrigger FallingTrigger SampleWindow	True 25 1 10
DecodeErrorsMonitoringEnabled RisingTrigger FallingTrigger SampleWindow	True 200 0 10
ISLMonitoringEnabled RisingTrigger FallingTrigger SampleWindow	True 2 0 10
LoginMonitoringEnabled RisingTrigger FallingTrigger SampleWindow	True 5 1 10

Table A-4. Alarm Threshold Configuration Defaults (Continued)

Parameter	Default
LogoutMonitoringEnabled	True
RisingTrigger	5
FallingTrigger	1
SampleWindow	10
LOSMonitoringEnabled	True
RisingTrigger	100
FallingTrigger	5
SampleWindow	10

Table A-5. SNMP Configuration Defaults

Parameter	Default
Contact	Undefined
Location	Undefined
Description	Undefined
Trap [1-5] Address	Trap 1: 10.0.0.254; Traps 2–5: 0.0.0.0
Trap [1-5] Port	Undefined
Trap [1-5] Severity	Warning
Trap [1-5] Enabled	False
ObjectID	1.3.6.1.4.1.1663.1.1.1.1.11
AuthFailureTrap	False

Table A-6. System Configuration Defaults

Parameter	Default
Ethernet Network IP Address	10.0.0.1
Ethernet Network IP Mask	255.0.0.0
Ethernet Gateway Address	10.0.0.254
Ethernet Network Discovery	Static
Admin Timeout	30 minutes
Security Enabled	False
LocalLog Enabled	True
Remotelog Enabled	False
Remote Log Host IP Address	Undefined

Set Command

Sets a variety of switch and port parameters.

Authority Admin for all keywords except Alarm Clear, Beacon, and Pagebreak which are available with User authority.

Syntax

set
alarm clear
beacon [state]
config [option]
log [option]
pagebreak [state]
port [option]
setup [option]
switch [state]

Keywords

alarm clear
Clears the alarm log. This keyword is available with User authority.

beacon [state]
Enables or disables the flashing of the Port Status LEDs according to [state]. This keyword is available with User authority. [state] can be one of the following:

on
Enables the flashing beacon.

off
Disables the flashing beacon.

config [option]
Sets port, switch, alarm threshold, and zoning configuration parameters. Refer to the ”Set Config Command” on page A-25.

log [option]
Specifies the type of entries to be entered in the event log. Refer to the ”Set Log Command” on page A-33.

pagebreak [state]
Specifies how much information is displayed on the screen at a time according to the value given by [state]. This keyword is available with User authority. [state] can be one of the following:

on
Limits the display of information to 20 lines at a time. The page break functions affects the following commands: Alias (List, Members), Show (Alarm, Log), Zone (List, Members), Zoneset (List, Zones), Zoning (Active, List).

off
Allows continuous display of information without a break.

port [option]
Sets port state and speed for the specified port temporarily until the next switch reset or new configuration activation. Refer to the ”Set Port Command” on page A-36.

setup [option]
Changes SNMP and system configuration settings. Refer to the ”Set Setup Command” on page A-37.

switch [state]
Temporarily changes the administrative state for all ports on the switch to the state given by [state]. The previous Set Config Switch settings are restored after a switch reset or a reactivation of a switch configuration. [state] can be one of the following:

online
Places all ports online

offline
Places all ports offline.

diagnostics
Prepares all ports for testing.

Set Config Command

Sets switch, port, alarm threshold, and zoning configuration parameters.

Authority Admin authority and a Config Edit session

Syntax

set config
port *[port_number]*
ports *[port_number]*
switch
threshold
zoning

Keywords

port *[port_number]*
Initiates an edit session in which to change configuration parameters for the port number given by [port_number]. If you omit [port_number], the system begins with port 0 and proceeds in order through port 63. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets. Enter “q” to cancel the configuration for one port, or “qq” to cancel the configuration for all ports. Table A-7 describes the port parameters.

ports *[port_number]*
Initiates an editing session in which to change configuration parameters for all ports based on the configuration for the port given by [port_number]. If you omit [port_number], port 0 is used. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets. Enter “q” to cancel the configuration. Table A-7 describes the port parameters.

Table A-7. Set Config Port Parameters

Parameter	Description
AdminState	Port administrative state: online, offline, diagnostics, or down.
LinkSpeed	1Gb/sec or 2 Gb/sec
PortType	Type of port
TLPortMode	Initiates the configuration of ports attributes. Indicates whether using initiator or target devices on the loop. If you specify [port_number], the display will present attributes for that port only; otherwise, all attributes for all ports will be available for configuration.

Table A-7. Set Config Port Parameters (Continued)

Parameter	Description
ISLSecurity	E_Port security. Determines which switches a port will establish a link with. ■ Any - we will link with any switch. ■ Ours - we will only link to another QLogic switch. ■ None - the port will not establish an ISL link.
SymbolicPortName	Descriptive name
ALFairness	Default is switch that has priority
ARB_FF	Use ARB_FF instead of idles on loop FCAL option
InteropCredit	Number of buffer-to-buffer credits per port. 0 means the default (12) is unchanged.
ExtCredit	Extended credit port
FANEnable	Fabric Address Notification. If enabled, notifies logged-in NL_Ports of the FL_Port address, port name, and node name.
LCFEnable	Link control frame preference, R_CTL = 0xC
MFSEnable	Multi-Frame Sequence bundling
MFS_TOV	MFS limit for camp on
MSEnable	Management Server enable on this port
NoClose	Don’t close unless another device arbitrates
I/O Stream Guard	Enables or disables the suppression of RSCN messages
VIEnable	Enable VI preference routing
CheckAlps	Close before sending frames to new target

switch
Initiates an editing session in which to change switch configuration settings. The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table A-8. Set Config Switch Parameters

Parameter	Description
AdminState	Switch administrative state: online, offline, or diagnostics
Broadcast Enable	Enables (True) or disables (False) forwarding of broadcast frames.
InbandEnabled	Enables (True) or disables (False) the ability to manage the switch over an ISL.
DefaultDomainID	Default domain ID setting
DomainIDLock	Prevents (True) or allows (False) dynamic reassignment of the domain ID.
SymbolicName	Descriptive name
R_T_TOV	Receiver Transmitter Timeout Value. Specifies the number of milliseconds a port is to wait to receive a response from another port. The default is 100.
R_A_TOV	Resource Allocation Timeout Value. The number of milliseconds the switch waits to allow two ports to allocate enough resources to establish a link. The default is 10000.
E_D_TOV	Error Detect Timeout Value. The number of milliseconds a port is to wait for errors to clear. The default is 2000.
FS_TOV	Fabric Stability Timeout Value. The default is 5000 msec.
DS_TOV	Distributed Services Timeout Value (Management Server, Name Server). The default is 5000 msec.

Table A-8. Set Config Switch Parameters

Parameter	Description
PrincipalPriority	The priority used in the FC-SW-2 principal switch selection algorithm. 1 is high, 255 is low.
ConfigDescription	The name for the configuration. The default is undefined.

threshold

Initiates a configuration session by which to generate and log alarms for selected events. The system displays each event, its thresholds, and sampling interval one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets. These parameters must be saved in a configuration and activated before they will take effect. Refer to the "Config Command" on page A-7 for information about saving and activating a configuration. Table A-9 describes the Set Config Threshold parameters.

Table A-9. Set Config Threshold Parameters

Parameter	Description
Threshold Monitoring Enabled	Master enable/disable parameter for all events. Enables (True) or disables (False) the generation of all enabled event alarms.
CRCErrorsMonitoringEnabled DecodeErrorsMonitoringEnabled ISLMonitoringEnabled LoginMonitoringEnabled LogoutMonitoringEnabled LOSMonitoringEnabled	The event type enable/disable parameter. Enables (True) or disables (False) the generation of alarms for each of the following events: ■ CRC errors ■ Decode errors ■ ISL connection count ■ Login errors ■ Logout errors ■ Loss-of-signal errors
Rising Trigger	The event count above which an event is logged. Once the count exceeds the rising threshold, one alarm is logged. The switch will not generate another alarm for that event until the count falls below the falling threshold and rises again above the rising threshold.

Table A-9. Set Config Threshold Parameters

Parameter	Description
Falling Trigger	The event count above which an event becomes eligible for logging in the alarm log.
Sample Window	The period of time in seconds in which to count events.

zoning
Initiates an editing session in which to change switch zoning attributes. The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table A-10. Set Config Zoning Parameters

Parameter	Description
AutoSave	Determines whether zoning changes will be saved to flash (non-volatile) memory or to RAM (volatile) in each switch. The default is On.
Default	Determines communication among ports/devices in the absence of an active zone set. “All” enables all ports/devices to communicate with one another. “None” prohibits communication among ports/devices.

Examples

The following is an example of the Set Config Port command:

```
SANbox2 #> admin start
SANbox2  (admin) #> config edit
SANbox2  (admin-config) #> set config port 1

  A list of attributes with formatting and current values will follow.
  Enter a new value or simply press the ENTER key to accept the current value.
  If you wish to terminate this process before reaching the end of the list
  press ’q’ or ’Q’ and the ENTER key to do so.

  Configuring Port Number:  1
  -----------------------
```

```
  AdminState    (1=Online, 2=Offline, 3=Diagnostics, 4=Down) [Online]
  LinkSpeed     (1=1Gb/s, 2=2Gb/s, 3=Auto)                   [Auto  ]
  PortType      (TL / GL / G / F / FL / Donor)               [GL    ]
  TLPortMode    (1=TLTargetMode, 2=TLInitiatorMode)          [TLInitiatorMode]
  ISLSecurity   (Any /  Ours / None)                         [Any   ]
  SymPortName   (string, max=32 chars)                       [Port2 ]
  ALFairness    (True / False)                               [False ]
  ARB_FF        (True / False)                               [False ]
  InteropCredit (decimal value, 0-255)                       [0     ]
  ExtCredit     (decimal value, 0-65535)                     [0     ]
  FANEnable     (True / False)                               [True  ]
  LCFEnable     (True / False)                               [False ]
  MFSEnable     (True / False)                               [False ]
  MFS_TOV       (decimal value, 10-20480 msec)               [640   ]
  MSEnable      (True / False)                               [True  ]
  NoClose       (True / False)                               [False ]
  I/O Stream Guard -
              (Suppress RSCN)(Enable / Disable)            [Disable]
  VIEnable      (True / False)                               [False ]
  CheckAlps     (True / False)                               [False ]

  Finished configuring attributes.
  This configuration must be saved (see config save command) and
  activated (see config activate command) before it can take effect.
  To discard this configuration use the config cancel command.
```

The following is an example of the Set Config Switch command:

```
SANbox2 #> admin start
SANbox2  (admin) #> config edit
SANbox2  (admin-config) #> set config switch

  A list of attributes with formatting and default values will follow.
  Enter a new value or simply press the ENTER key to accept the current value.
  If you wish to terminate this process before reaching the end of the list
  press ’q’ or ’Q’ and the ENTER key to do so.

  AdminState         (1=Online, 2=Offline, 3=Diagnostics) [Online       ]
  InbandEnabled      (True / False)                       [False        ]
  BroadcastEnable    (True / False)                       [False        ]
  DefaultDomainID    (decimal value, 1-239)               [11           ]
  DomainIDLock       (True / False)                       [True         ]
  SymbolicName       (string, max=32 chars)               [SANbox2 switch]
  R_T_TOV            (decimal value, 1-1000 msec)         [100          ]
```

```
  R_A_TOV            (decimal value, 100-100000 msec)     [10000        ]
  E_D_TOV            (decimal value, 10-20000 msec)       [2000         ]
  FS_TOV             (decimal value, 100-100000 msec)     [5000         ]
  DS_TOV             (decimal value, 100-100000 msec)     [5000         ]
  PrincipalPriority  (decimal value, 1-255)               [254          ]
  ConfigDescription  (string, max=32 chars)               [             ]
```

The following is an example of the Set Config Threshold command:

```
SANbox2 #> admin start
SANbox2  (admin) #> config edit
SANbox2 (admin-config) #> set config threshold

A list of attributes with formatting and current values will follow.
 Enter a new value or simply press the ENTER key to accept the current value.
  If you wish to terminate this process before reaching the end of the list
 press ’q’ or ’Q’ and the ENTER key to do so.

ThresholdMonitoringEnabled     (True / False)              [True]

CRCErrorsMonitoringEnabled     (True / False)              [True]
  RisingTrigger                (decimal value, 1-1000)     [25 ]
  FallingTrigger               (decimal value, 0-1000)     [1 ]
  SampleWindow                 (decimal value, 1-1000 sec) [10 ]

DecodeErrorsMonitoringEnabled  (True / False)              [True]
  RisingTrigger                (decimal value, 1-1000)     [200 ]
  FallingTrigger               (decimal value, 0-1000)     [0 ]
  SampleWindow                 (decimal value, 1-1000 sec) [10 ]

ISLMonitoringEnabled           (True / False)              [True]
  RisingTrigger                (decimal value, 1-1000)     [2 ]
  FallingTrigger               (decimal value, 0-1000)     [0 ]
  SampleWindow                 (decimal value, 1-1000 sec) [10 ]

LoginMonitoringEnabled         (True / False)              [True]
  RisingTrigger                (decimal value, 1-1000)     [5 ]
  FallingTrigger               (decimal value, 0-1000)     [1 ]
  SampleWindow                 (decimal value, 1-1000 sec) [10 ]

LogoutMonitoringEnabled        (True / False)              [True]
  RisingTrigger                (decimal value, 1-1000)     [5 ]
  FallingTrigger               (decimal value, 0-1000)     [1 ]
  SampleWindow                 (decimal value, 1-1000 sec) [10 ]
```

```
LOSMonitoringEnabled          (True / False)               [True]
  RisingTrigger               (decimal value, 1-1000)     [100 ]
  FallingTrigger              (decimal value, 0-1000)     [5 ]
  SampleWindow                (decimal value, 1-1000 sec) [10 ]

Finished configuring attributes.
This configuration must be saved (see config save command) and activated (see
config activate command) before it can take effect. To discard this configuration
use the config cancel command.config.
```

The following is an example of the Set Config Zoning command.

```
SANbox2 #> admin start
SANbox2  (admin) #> config edit
SANbox2  (admin-config) #> set config zoning

A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the current value.
If you wish to terminate this process before reaching the end of the list press ’q’
or ’Q’ and the ENTER key to do so.

  AutoSave      (True / False)  [True]
  Default       (All / None)    [All ]

  Finished configuring attributes.
  This configuration must be saved (see config save command) and
  activated (see config activate command) before it can take effect.
  To discard this configuration use the config cancel command.
```

Set Log Command

Specifies the type of entries to be entered in the event log. The log is a storage file contained on the switch. The log can hold a maximum of 200 entries. When the log becomes full, the entries are replaced, starting with the oldest entry, to produce a list of the last 200 events which occurred. Log entries are created for ports, components, and event severity levels.

Authority Admin

Syntax

set log
archive
clear
component [list]
level [level]
port [port_list]
restore
save
start (default)
stop

Keywords

archive
Archives the log entries to a file on the switch named *logfile that* can be downloaded from the switch using FTP. To download the log file, open an FTP session, log in with account name/password of “images” for both, and type “get logfile”.

clear
Clears all log entries.

component [list]
Specifies one or more components to monitor for events. Use spaces to delimit values in the list. Choose one or more of the following values:

All
Monitors all components. To maintain optimal switch performance, do not use this setting with the Level keyword set to Info.

Chassis
Monitors chassis hardware components such as fans and power supplies.

Eport
Monitors all E_Ports.

Mgmtserver
Monitors management server status.

Nameserver
Monitors name server status.

None
Monitor none of the component events.

Other
Monitors other miscellaneous events.

Port
Monitors all port events

Switch
Monitors switch management events.

Zoning
Monitors zoning conflict events.

level [level]
Specifies the severity level given by [level] to use in monitoring events for the specified components or ports. [level] can be one of the following values:

Critical
Monitors critical events.

Warn
Monitors warning events.

Info
Monitors informational events. To maintain optimal switch performance, do not use this setting with the Component keyword set to All.

None
Monitors none of the severity levels.

port [port_list]
Specifies one or more ports to monitor for events. Choose one of the following values:

[port_list]
Specifies port or ports to monitor. Use spaces to delimit values in the list. Ports are numbered beginning with 0.

All
Specifies all ports.

None
Disables monitoring on all ports.

restore
Returns the port, component, and level settings to the default values.

save
Saves the log settings for the component, level, and port. These settings remain in effect after a switch reset. The log settings can be viewed using the Show Log Settings command. To export log entries to a file, use the Set Log Archive command.

start
Starts the logging of events based on the Port, Component, and Level keywords assigned to the current configuration. The logging continues until you enter the Set Log Stop command.

stop
Stops logging of events.

Notes To maintain optimal switch performance, do not set the Component keyword to All and the Level keyword to Info at the same time.

Set Port Command

Sets port state and speed for the specified port temporarily until the next switch reset or new configuration activation. This command also clears port counters.

Authority Admin

Syntax

set port [port_number]
bypass [alpa]
clear
enable [alpa]
speed [transmission_speed]
state [state]

Keywords

[port_number]
Specifies the port. Ports are numbered beginning with 0.

bypass [alpa]
Sends a Loop Port Bypass (LPB) to a specific ALPA or to all ALPAs on the loop. [alpa] can be a specific ALPA or the keyword ALL to choose all ALPAs.

clear
Clears the counters on the specified port.

enable [alpa]
Sends a Loop Port Enable (LPE) to all ALPAs on the arbitrated loop. [alpa] can be a specific ALPA or the keyword ALL to choose all ALPAs.

speed [transmission_speed]
Specifies the speed for the specified port. Choose one of the following values:

1Gb/s
One gigabit per second.

2Gb/s
Two gigabits per second.

Auto
The port speed is automatically detected.

state [state]
Specifies the administrative state for the specified port. Choose one of the following port state values:

Online
Places the port online.

Offline
Places the port offline.

Diagnostics
Prepares the port for testing.

Down
Disables the port.

Set Setup Command

Changes SNMP and system configuration settings. The switch maintains one SNMP configuration and one system configuration.

Authority Admin

Syntax **set setup**
snmp
system

Keywords **snmp**
Prompts you in a line-by-line fashion to change SNMP configuration settings. Table A-11 describes the SNMP fields. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table A-11. SNMP Configuration Settings

Entry	Description
Contact	Specifies the name of the person to be contacted to respond to trap events. The default is undefined.
Location	Specifies the name of the switch location. The default is undefined.
Trap [1-5] Address	Specifies the IP address to which SNMP traps are sent. The default address for trap 1 is 10.0.0.254. The default address for traps 2–5 is 0.0.0.0.
Trap [1-5] Port	Specifies the port for which SNMP traps are sent.
Trap [1-5] Severity	Specifies the severity level to use when monitoring trap events. The default is Warning
Trap [1-5] Enabled	Specifies whether traps (event information) are enabled or disabled (default).
ReadCommunity	Read Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
WriteCommunity	Write Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
TrapCommunity	Trap Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
AuthFailureTrap	Specifies the IP address where a notification is sent in the event of an authentication failure.

system
Prompts you in a line-by-line fashion to change system configuration settings. Table A-12 describes the system configuration fields. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table A-12. System Configuration Settings

Entry	Description
Eth0NetworkAddress	Internet Protocol (IP) address for the Ethernet port.
Eth0NetworkMask	Subnet mask address for the Ethernet port.
Eth0GatewayAddress	IP address gateway.
Eth0NetworkDiscovery	Boot Method (1 - Static, 2 - Bootp, 3 - DHCP, 4 - RARP)
AdminTimeout	Specifies the amount of time in minutes the switch waits before terminating an idle Admin session. Zero (0) disables the time out threshold. The default is 30, the maximum is 1440.
Security Enabled	Enables or disables the enforcement of account names and passwords.
Local Log Enabled	Enables or disables the saving of log information on the switch.
Remote Log Enabled	Whether remote logging of is enabled or disabled. If enabled, log information is saved to a remote host that supports the syslog protocol.
Remote LogHost IP Address	The IP address of the host that will receive the remote log information if remote logging is enabled.

Notes

The two components of security are user authentication and fabric security. The user must be authenticated before gaining access to a switch. If an invalid account name/password combination is entered, that user can not access the switch, and thus can not gain access to the fabric. If security is enabled (True) and a valid account name/password combination is entered, that user can access the switch but can not execute any command that exceeds their authority (privileges) level. If security is disabled (False) and a valid account name/password combination is entered, that user has access to all switches in the fabric and can execute all commands (both user and admin), regardless of their authority (privileges) level.

Examples

The following is an example of the Set Setup SNMP command:

```
SANbox2 #> admin start
SANbox2 (admin) #> set setup snmp
  A list of attributes with formatting and current values will follow.
  Enter a new value or simply press the ENTER key to accept the current value.
  If you wish to terminate this process before reaching the end of the list
  press 'q' or 'Q' and the ENTER key to do so.

  Trap Severity Options
  ---------------------
  unknown, emergency, alert, critical, error, warning, notify, info, debug, mark

  Contact             (string, max=32 chars)       [Technical Support]
  Location            (string, max=32 chars)       [TSLab             ]
  Trap1Address        (dot-notated IP Address)     [10.20.71.15       ]
  Trap1Port           (decimal value)              [162               ]
  Trap1Severity       (see allowed options above)  [warning           ]
  Trap1Enabled        (True / False)               [False             ]
  Trap2Address        (dot-notated IP Address)     [0.0.0.0           ]
  Trap2Port           (decimal value)              [162               ]
  Trap2Severity       (see allowed options above)  [warning           ]
  Trap2Enabled        (True / False)               [False             ]
  Trap3Address        (dot-notated IP Address)     [0.0.0.0           ]
  Trap3Port           (decimal value)              [162               ]
  Trap3Severity       (see allowed options above)  [warning           ]
  Trap3Enabled        (True / False)               [False             ]
  Trap4Address        (dot-notated IP Address)     [0.0.0.0           ]
  Trap4Port           (decimal value)              [162               ]
  Trap4Severity       (see allowed options above)  [warning           ]
  Trap4Enabled        (True / False)               [False             ]
  Trap5Address        (dot-notated IP Address)     [0.0.0.0           ]
  Trap5Port           (decimal value)              [162               ]
  Trap5Severity       (see allowed options above)  [warning           ]
  Trap5Enabled        (True / False)               [False             ]
  ReadCommunity       (string, max=32 chars)       [public            ]
  WriteCommunity      (string, max=32 chars)       [private           ]
  TrapCommunity       (string, max=32 chars)       [public            ]
  AuthFailureTrap     (True / False)               [False             ]

  Do you want to save and activate this snmp setup? (y/n) [n]
```

The following is an example of the Set Setup System command:

```
SANbox2 (admin) #> set setup system
A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the current value.
If you wish to terminate this process before reaching the end of the list
press 'q' or 'Q' and the ENTER key to do so.

Eth0NetworkAddress      (dot-notated IP Address)                  [10.0.0.1      ]
Eth0NetworkMask         (dot-notated IP Address)                  [255.255.255.0 ]
Eth0GatewayAddress      (dot-notated IP Address)                  [10.0.0.254    ]
Eth0NetworkDiscovery    (1=Static, 2=Bootp, 3=Dhcp, 4=Rarp)       [Static        ]
AdminTimeout            (dec value 0-1440 minutes, 0=never)       [30            ]
SecurityEnabled         (True / False)                            [False         ]
LocalLogEnabled         (True / False)                            [True          ]
RemoteLogEnabled        (True / False)                            [False         ]
RemoteLogHostAddress    (dot-notated IP Address)                  [10.0.0.254    ]

  Do you want to save and activate this system setup? (y/n): [n]
```

Show Command

Displays fabric, switch, and port operational information.

Authority User

Syntax **show**
- about
- alarm
- broadcast
- chassis
- config [option]
- domains
- donor
- fabric
- interface
- log *[option]*
- lsdb
- mem [count]
- ns *[option]*
- pagebreak
- perf *[option]*
- port *[port_number]*
- post log
- setup [option]
- steering *[domain_id]*
- support
- switch
- topology
- users
- version

Keywords

about
Displays an introductory set of information about operational attributes of the switch. This keyword is equivalent to the Version keyword.

alarm
Displays the last 200 alarm entries.

broadcast
Displays the broadcast tree information and all ports that are currently transmitting and receiving broadcast frames.

chassis
Displays chassis component status and temperature.

config [option]
Displays switch and port configuration attributes. Refer to the Show Config Command on page A-54.

domains
Displays list of each domain and its worldwide name in the fabric.

donor
Displays list of current donor configuration for all ports.

fabric
Displays list of each domain, fabric ID, worldwide name, node IP address, port IP address, and symbolic name in the fabric.

interface
Displays the status of the active network interfaces.

log *[option]*
Displays log entries. Refer to the Show Log Command on page A-57.

lsdb
Displays Link State database information.

mem [count]
Displays information about memory activity for the number of seconds given by [count]. If you omit [count], the value 1 is used. Displayed memory values are in 1K block units.

Note: This keyword will display memory activity updates until [count] is reached – it cannot be interrupted. Therefore, avoid using large values for [count].

ns *[option]*
Displays name server information for the specified [option]. If you omit [option], name server information for the local domain ID is displayed. [option] can have the following values:

all
Displays name server information for all switches and ports.

[domain_id]
Displays name server information for the switch given by [domain_id]. [domain_id] is a switch domain ID.

[port_id]
Displays name server information for the port given by [port_id]. [port_id] is a port Fibre Channel address.

pagebreak
Displays the current pagebreak setting. The pagebreak setting limits the display of information to 20 lines (On) or allows the continuous display of information without a break (Off).

perf *[option]*
Displays performance information for all ports. Refer to the Show Perf Command on page A-59.

port *[port_number]*
Displays operational information for the port given by [port_number]. Ports are numbered beginning with 0. If the port number is omitted, information is displayed for all ports. Table A-13 describes the port parameters.

Table A-13. Show Port Parameters

Entry	Description
AIinit	Incremented each time the port begins AL initialization.
AIinitError	Number of times the port entered initialization and the initialization failed.
ClassXFramesIn	Number of class *x* frames received by this port.
ClassXFramesOut	Number of class *x* frames sent by this port.
ClassXWordsIn	Number of class *x* words received by this port.
ClassXWordsOut	Number of class *x* words sent by this port.
DecodeError	Decoding error detected.
FBusy	Number of times the switch sent a F_BSY because Class 2 frame could not be delivered within ED_TOV time. Number of class 2 and class 3 fabric busy (F_BSY) frames generated by this port in response to incoming frames. This usually indicates a busy condition on the fabric or N_port that is preventing delivery of this frame.
Flowerrors	Received a frame when there were no available credits.
FReject	Number of frames from devices that were rejected.
InvalidCRC	Invalid CRC detected.
InvalidDestAddr	Invalid destination address detected.
LIP ALPD ALPS	Number of F7, AL_PS LIPs, or AL_PD (vendor specific) resets, performed.
LIPF7ALPS	This LIP is used to reinitialize the loop. An L_port, identified by AL_PS, may have noticed a performance degradation and is trying to restore the loop.
LIPF8ALPS	This LIP denotes a loop failure detected by the L_port identified by AL_PS.

Table A-13. Show Port Parameters (Continued)

Entry	Description
LIPF7F7	A loop initialization primitive frame used to acquire a valid AL_PA.
LIPF8F7	A loop initialization primitive frame used to indicate that a loop failure has been detected at the receiver.
Link Failures	Number of optical link failures detected by this port. A link failure is a loss of synchronization for a period of time greater than the value of R_T_TOV or by loss of signal while not in the offline state. A loss of signal causes the switch to attempt to re-establish the link. If the link is not re-established by the time specified by R_T_TOV, a link failure is counted. A link reset is performed after a link failure.
Login	Time when user logged in.
Logout	Time when user logged out.
LoopTimeouts	A two (2) second timeout as specified by FC-AL-2.
LossOfSync	Number of synchronization losses (>100 ms) detected by this port. A loss of synchronization is detected by receipt of an invalid transmission word.
PrimSeqErrors	Primitive sequence errors detected.
EportConnects	Shows the count of the number of times an E_Port connected through ISL negotiation.
RxLinkResets	Number of link reset primitives received from an attached device.
RxOfflineSeq	Number of offline sequences received. An OLS is issued for link initialization, a Receive & Recognize Not_Operational (NOS) state, or to enter the offline state.
TotalErrors	Total number of errors detected.
TotalLIPsRecvd	Number of loop initialization primitive frames received by this port.
TotalLinkResets	Total number of link reset primatives.
TotalOfflineSeq	Total number of Offline Sequences issued by this port.
TotalRxFrames	Total number of frames received by this port.
TotalRxWords	Total number of words received by this port.
TotalTxFrames	Total number of frames issued by this port.

Table A-13. Show Port Parameters (Continued)

Entry	Description
TotalTxWords	Total number of words issued by this port.
TxLinkResets	Number of Link Resets issued by this port.
TxOfflineSeq	Total number of Offline Sequences issued by this port.
TxWait	Time waiting to transmit when blocked with no credit. Measured in FC Word times.

post log
Displays the Power On Self Test (POST) log which contains results from the POST.

setup [option]
Displays setup attributes for the system, SNMP, and the switch manufacturer. Refer to the Show Setup Command on page A-61.

steering *[domain_id]*
Displays the routes that data takes to the switch given by [domain_id]. If you omit [domain_id], the system displays routes for all switches in the fabric.

support
Executes a series of commands that display a complete description of the switch, its configuration, and operation. The display can be captured from the screen and used for diagnosing problems. This keyword is intended for use at the request of your authorized maintenance provider. The commands that are executed include the following:

- Date
- Alias List
- Config List
- Date
- History
- Ps
- Show (About, Alarm, Backtrace, Chassis, Config Port, Config Switch, Dev, Dev Settings, Domains, Donor, Fabric, Log, Log Settings, Lsdb, Mem, Ns, Perf, Port, Setup Mfg, Setup Snmp, Setup System, Steering, Switch, Topology, Users)
- Uptime
- User Accounts
- Whoami

- Zoneset (Active, List)
- Zoning (History, Limits, List)

switch
Displays switch operational information.

topology
Displays all connected devices.

users
Displays a list of logged-in users. This is equivalent to the User List command.

version
Displays an introductory set of information about operational attributes of the switch. This keyword is equivalent to the About keyword.

Examples

The following is an example of the Show Broadcast command:

```
SANbox2 #> show broadcast

  Group Member Ports ISL Ports
  ----- ------------ ---------
   0     13
```

The following is an example of the Show Chassis command:

```
SANbox2 #> show chassis

  Chassis Information
  -------------------
  BoardTemp (1) - Degrees Celsius   32
  BoardTemp (2) - Degrees Celsius   36
  FanStatus (1)                     Good
  FanStatus (2)                     Good
  PowerSupplyStatus (1)             Good
  PowerSupplyStatus (2)             Good
```

The following is an example of the Show Domains command:

```
SANbox2 #> show domains

  Principal switch is (local): 10:00:00:c0:dd:00:90:6b

  Domain ID List:
        Domain 22 (0x16)        WWN = 10:00:00:c0:dd:00:90:6b
```

The following is an example of the Show Fabric command:

```
SANbox2 #> show fabric
Switch     ID     WWN                      Eth0IPAddress  SymbolicName
------     --     ---                      -------------  ------------
1 (0x1)    fffc01 10:00:00:c0:dd:00:bd:ec   10.20.68.107
4 (0x4)    fffc04 10:00:00:c0:dd:00:80:21   10.20.68.14
```

The following is an example of the Show NS (local domain) command:

```
SANbox2 #> show ns
Seq Domain     Port    Port
No  ID         ID      Type  COS  PortWWN                   NodeWWN
--- ------     ------  ----  ---  -------                   -------
1   99 (0x63)  630425  NL    3    21:00:00:20:37:d9:4b:2a   20:00:00:20:37:d9:4b:2a
2   99 (0x63)  6304e8  NL    3    21:00:00:20:37:d9:4b:2f   20:00:00:20:37:d9:4b:2f
3   99 (0x63)  6304ef  NL    3    21:00:00:20:37:d9:4f:46   20:00:00:20:37:d9:4f:46
```

The following is an example of the Show NS Domain_ID command:

```
SANbox2 #> show ns domain_ID

Port ID: 630425
--------
PortType          NL
PortWWN           21:00:00:20:37:d9:4b:2a
SymbolicPortName
NodeWWN           20:00:00:20:37:d9:4b:2a
SymbolicNodeName
NodeIPAddress     0.0.0.0
ClassOfService    3
PortIPAddress     0.0.0.0
FabricPortName    20:04:00:c0:dd:00:b7:ea
FC4Type           FCP
FC4Desc           SEAGATE  ST318304FC (Rev. 0005)
```

The following is an example of the Show Interface command:

```
SANbox2 #> show interface
eth0      Link encap:Ethernet  HWaddr 00:C0:DD:00:BD:ED
          inet addr:10.20.68.107  Bcast:10.20.68.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:4712 errors:0 dropped:0 overruns:0 frame:0
          TX packets:3000 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:415313 (405.5 Kb)  TX bytes:716751 (699.9 Kb)
          Interrupt:11 Base address:0xfcc0
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:304 errors:0 dropped:0 overruns:0 frame:0
          TX packets:304 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:20116 (19.6 Kb)  TX bytes:20116 (19.6 Kb)
```

The following is an example of the Show Port command:

```
SANbox2 #> show port 1
Port Number: 1
  ------------
  AdminState       Online              PortID           640100
  AsicNumber       0                   PortWWN
  AsicPort         1                   RunningType      Donor
  ConfigType       Donor               SFPPartNumber    PL-XPL-00-S23-00
  DiagStatus       Passed              SFPRevision
  EpConnState      None                SFPType          100-M5-SN-I
  EpIsoReason      NotApplicable       SFPVendor        PICOLIGHT
  LinkSpeed        2Gb/s               SFPVendorID      00850400
  LinkState        Active              SymbolicName     Port1
  LoginStatus      LoggedIn            SyncStatus       SyncLost
  MaxCredit        0                   XmitterEnabled   False
  OperationalState Online

  ALInit          0         FlowErrors      0         PrimSeqErrors   0
  ALInitError     0         FReject         0         RxLinkResets    0
  Class2FramesIn  0         InvalidCRC      0         RxOfflineSeq    0
  Class2FramesOut 0         InvalidDestAddr 0         TotalErrors     0
  Class2WordsIn   0         LIP_AL_PD_AL_PS 0         TotalLIPsRecvd  0
  Class2WordsOut  0         LIP_F7_AL_PS    0         TotalLinkResets 0
  Class3FramesIn  0         LIP_F7_F7       0         TotalOfflineSeq 0
```

```
  Class3FramesOut 0         LIP_F8_AL_PS    0         TotalRxFrames   0
  Class3Toss      0         LIP_F8_F7       0         TotalRxWords    0
  Class3WordsIn   0         LinkFailures    0         TotalTxFrames   0
  Class3WordsOut  0         Login           0         TotalTxWords    0
  DecodeErrors    0         Logout          0         TxLinkResets    0
  EpConnects      0         LoopTimeouts    0         TxOfflineSeq    0
  FBusy           0         LossOfSync      0         TxWaits         0
```

The following is an example of the Show Setup SNMP command:

```
SANbox2 #> show setup snmp
SNMP Information
  ----------------
  Contact               Technical Support
  Location              TSLab
  Description           QLogic SANbox2 FC Switch
  Trap1Address          10.20.71.15
  Trap1Port             162
  Trap1Severity         warning
  Trap1Enabled          True
  Trap2Address          0.0.0.0
  Trap2Port             162
  Trap2Severity         warning
  Trap2Enabled          False
  Trap3Address          0.0.0.0
  Trap3Port             162
  Trap3Severity         warning
  Trap3Enabled          False
  Trap4Address          0.0.0.0
  Trap4Port             162
  Trap4Severity         warning
  Trap4Enabled          False
  Trap5Address          0.0.0.0
  Trap5Port             162
  Trap5Severity         warning
  Trap5Enabled          False
  ObjectID              1.3.6.1.4.1.1663.1.1.1.1.11
  AuthFailureTrap       False
```

The following is an example of the Show Setup System command:

```
SANbox2 (admin) #> show setup system
System Information
  ------------------
  Eth0NetworkAddress       10.20.11.112
  Eth0NetworkMask          255.255.252.0
  Eth0GatewayAddress       10.20.8.254
  Eth0NetworkDiscovery     Static
  AdminTimeout             30
  SecurityEnabled          True
  LocalLogEnabled          True
  RemoteLogEnabled         True
  RemoteLogHostAddress     10.20.11.106
```

The following is an example of the Show Switch command:

```
SANbox2 #> show switch
Switch Information
------------------
SymbolicName                    SANbox2-203
SwitchWWN                       10:00:00:c0:dd:00:b8:b5
SwitchType                      SANbox2-16
PromVersion                     V0.1-5-18  (Fri Jun 15 10:22:09 2001)
CreditPool                      0
DomainID                        3
LogLevel                        Info
MaxPorts                        16
NumberOfAsics                   1
NumberOfPortsPerAsic            16
NumberOfResets                  127
ReasonForLastReset              NormalReset
SWImageVersion (1) - build date V0.4-6-16  (Thu Jun 14 04:06:42 2001)
SWImageVersion (2) - build date V0.4-6-18  (Fri Jun 15 10:22:09 2001)
ActiveConfiguration             default
ActiveSWImage                   2
AdminState                      Online
AdminModeActive                 False
BeaconOnStatus                  False
OperationalState                Online
PrincipalSwitchRole             False
BoardTemp (1) - Degrees Celsius 32
BoardTemp (2) - Degrees Celsius 36
SwitchDiagnosticsStatus         Passed
SwitchTemperatureStatus         Normal
```

The following is an example of the Show Topology command:

```
SANbox2 #> show topology
Unique ID Key
-------------
A = ALPA,  D = Domain ID,  P = Port ID
Port   Local Local                   Remote  Remote                   Unique
Number Type  PortWWN                 Type    NodeWWN                  ID
------ ----- -------                 ------  -------                  ------
5      F     20:05:00:c0:dd:00:bd:ec   N     20:00:00:00:c9:22:1e:93  010500 P
10     E     20:0a:00:c0:dd:00:bd:ec   E     10:00:00:c0:dd:00:80:21  4(0x4) D
```

The following is an example of the Show Topology command for port 1:

```
SANbox2  #> show topology 1
  Local Link Information
  ----------------------
  PortNumber 1
  PortID     650100
  PortWWN    20:01:00:c0:dd:00:91:11
  PortType   F
Remote Link Information
-----------------------
Device 0
NodeWWN 50:80:02:00:00:06:d5:38
PortType NL
Description (NULL)
IPAddress 0.0.0.0
Device 1
NodeWWN 20:00:00:20:37:2b:08:c9
PortType NL
Description (NULL)
IPAddress 0.0.0.0
Device 2

Description (NULL)
IPAddress 0.0.0.0

Device 3

NodeWWN 20:00:00:20:37:2b:05:c9
PortType NL
Description (NULL)
IPAddress 0.0.0.0
```

The following is an example of the Show Version command:

```
SANbox2 #> show version
SystemDescription  QLogic SANbox2 FC Switch
Eth0NetworkAddress 10.0.0.1 (use ’set setup system’ to update)
FCNetworkAddress   0.0.0.0 (use ’set setup system’ to update)
MACAddress         12:34:56:78:ab:cd
WorldWideName      10:00:00:c0:dd:00:90:a4
SymbolicName       SANbox2
SWImageVersion     V255.4-1-121
SWImageBuiltDate   Mon Jul 29 19:42:47 2002
DiagnosticsStatus  Passed
SecurityEnabled    False
```

Show Config Command

Displays switch, port, alarm threshold, and zoning attributes for the current configuration.

Authority User

Syntax **show config**
port *[port_number]*
switch
threshold
zoning

Keywords **port *[port_number]***
Displays configuration parameters for the port number given by [port_number]. Ports are numbered beginning with 0. If the port value is omitted, all ports are specified.

switch
Displays configuration parameters for the switch.

threshold
Displays alarm threshold parameters for the switch.

zoning
Displays zoning configuration parameters for the switch.

Examples The following is an example of the Show Config Port command:

```
SANbox2 #> show config port 3
  Configuration Name: default
  -------------------
  Port Number: 3
  ------------
  AdminState       Online
  LinkSpeed        Auto
  PortType         GL
  TLPortMode       TLInitiatorMode
  ISLSecurity      Any
  SymbolicName     Port4
  ALFairness       False
  ARB_FF           False
  InteropCredit    0
  FanEnable        True
  ExtCredit        0
  FanEnable        False
  LCFEnable        False
  MFSEnable        False
  MFS_TOV          640
  MSEnable         False
```

```
NoClose          False
IOStreamGuard    False
VIEnable         False
CheckAlps        False
```

The following is an example of the Show Config Switch command:

```
SANbox2 #> show config switch

  Configuration Name: default
  -------------------

  Switch Configuration Information
  --------------------------------
  AdminState            Online
  BroadcastEnabled      True
  InbandEnabled         True
  DomainID              100 (0x64)
  DomainIDLock          False
  SymbolicName          SANbox2-16 N_11.107
  R_T_TOV               100
  R_A_TOV               10000
  E_D_TOV               2000
  FS_TOV                5000
  DS_TOV                5000
  PrincipalPriority     254
  ConfigDescription     QLogic SANbox2 FC Switch
  ConfigLastSavedBy     guest@IB-session10
  ConfigLastSavedOn     Mon Nov 18 15:10:03 2002
```

The following is an example of the Show Config Threshold command:

```
  SANbox2 #> show config threshold
  Configuration Name: default
  ------------

  Threshold Configuration Information
  -----------------------------------
  ThresholdMonitoringEnabled    True
  CRCErrorsMonitoringEnabled    True
  RisingTrigger                 25
  FallingTrigger                1
  SampleWindow                  10
  DecodeErrorsMonitoringEnabled True
  RisingTrigger                 200
```

```
  FallingTrigger               0
  SampleWindow                 10
  ISLMonitoringEnabled         True
  RisingTrigger                2
  FallingTrigger               0
  SampleWindow                 10
  LoginMonitoringEnabled       True
  RisingTrigger                5
  FallingTrigger               1
  SampleWindow                 10
  LogoutMonitoringEnabled      True
  RisingTrigger                5
  FallingTrigger               1
  SampleWindow                 10
  LOSMonitoringEnabled         True
  RisingTrigger                100
  FallingTrigger               5
  SampleWindow                 10
```

The following is an example of the Show Config Zoning command:

```
SANbox2 #> show config zoning

 Configuration Name: default
  -------------------

  Zoning Configuration Information
  --------------------------------
  AutoSave              True
  Default               All
```

Show Log Command

Displays the contents of the log or the parameters used to create entries in the log. The log contains a maximum of 200 entries. When the log reaches its entry capacity, subsequent entries overwrite the existing entries, beginning with the oldest.

Authority User

Syntax **show log**
- component
- level
- options
- port
- settings

Keywords

component
Displays the components currently being monitored for events.

level
Displays the event severity level needed to create an entry in the log. If the severity level occurs on a port or on a component which is not defined, no entry is made in the log.

options
Displays the options used to set the component and log level attributes.

port
Displays the ports being monitored for events. If an event occurs which is of the defined level and on a defined component, but not on a defined port, no entry is made in the log.

settings
Displays the current settings for component, level and port. This command is equivalent to executing the following commands separately: Show Log Component, Show Log Level, and Show Log Port.

Examples The following is an example of the Show Log Component command:

```
SANbox2 #> show log component

  Current setting(s) for log component: NameServer
```

The following is an example of the Show Log Level command:

```
SANbox2 #> show log level

  Current setting(s) for log level: Info
```

The following is an example of the Show Log Options command:

```
SANbox2 #> show log options

  Allowed options for ’    level’: Critical,Warn,Info,None

  Allowed options for ’component’: All,None,NameServer,MgmtServer,Zoning,Switch,
Chassis,Blade,Port,Eport,Snmp,Other
```

The following is an example of the Show Log Port command:

```
SANbox2 #> show log port

  Current setting(s) for log port: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

The following is an example of the Show Log command:

```
[327][Wed Jan 25 09:36:54.860 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Eport
 State = E_A0_GET_DOMAIN_ID]
   [328][Wed Jan 25 09:36:54.860 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][FSPF
 PortUp state=0]
   [329][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
ing init hello]
   [330][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Proc
essing EFP, oxid= 0x8]
   [331][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Epor
t State = E_A2_IDLE]
   [332][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][EFP,
 WWN= 0x100000c0dd00b845, len= 0x30]
   [333][Wed Jan 25 09:36:54.864 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
ing LSU oxid= 0xc: type= 1]
   [334][Wed Jan 25 09:36:54.864 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
 Zone Merge Request]
   [335][Wed Jan 25 09:36:54.865 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][LSDB
 Xchg timer set]
   [336][Wed Jan 25 09:36:54.865 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Sett
ing attribute Oper.UserPort.0.8.EpConnState Connected]
```

Show Perf Command

Displays port performance in frames/second and bytes/second. If you omit the keyword, the command displays data transmitted (out), data received (in), and total data transmitted and received in frames/second and bytes per second.

Authority User

Syntax **show perf**
byte
inbyte
outbyte
frame
inframe
outframe
errors

Keywords

byte
Displays continuous performance data in total bytes/second transmitted and received for all ports. Type “q” and press the Enter key to stop the display.

inbyte
Displays continuous performance data in bytes/second received for all ports. Type “q” and press the Enter key to stop the display.

outbyte *[port_number]*
Displays continuous performance data in bytes/second transmitted for the set of 16 ports that include [port_number]. Type “q” and press the Enter key to stop the display.

frame *[port_number]*
Displays continuous performance data in total frames/second transmitted and received for the set of 16 ports that include [port_number]. Type “q” and press the Enter key to stop the display.

inframe *[port_number]*
Displays continuous performance data in frames/second received for the set of 16 ports that include [port_number]. Type “q” and press the Enter key to stop the display.

outframe *[port_number]*
Displays continuous performance data in frames/second transmitted for the set of 16 ports that include [port_number]. Type “q” and press the Enter key to stop the display.

errors *[port_number]*
Displays continuous error counts for the set of 16 ports that include [port_number]. Type “q” and press the Enter key to stop the display.

Examples

The following is an example of the Show Perf command:

```
SANbox2 #> show perf
Port   Bytes/s    Bytes/s    Bytes/s    Frames/s   Frames/s   Frames/s
  Number   (in)       (out)    (total)      (in)       (out)    (total)
  ------ -------    -------    -------    --------   --------   --------
  0      0          0          0          0          0          0
  1      0          0          0          0          0          0
  2      0          0          0          0          0          0
  3      0          0          0          0          0          0
  4      0          0          0          0          0          0
  5      0          0          0          0          0          0
  6      0          0          0          0          0          0
  7      0          0          0          0          0          0
  8      7K         136M       136M       245        68K        68K
  9      58K        0          58K        1K         0          1K
  10     0          0          0          0          0          0
  11     0          0          0          0          0          0
  12     0          0          0          0          0          0
  13     0          0          0          0          0          0
  14     0          7K         7K         0          245        245
  15     136M       58K        136M       68K        1K         70K
```

The following is an example of the Show Perf Byte command:

```
SANbox2 #> show perf byte
  Displaying bytes/sec (total)...  (Press 'q' and the ENTER key to stop display)

  0    1    2    3    4    5    6    7    8    9    10   11   12   13   14   15
  ------------------------------------------------------------------------------
  0    0    0    0    0    0    0    0    137M 58K  0    0    0    0    8K   137M
  0    0    0    0    0    0    0    0    136M 58K  0    0    0    0    8K   136M
  0    0    0    0    0    0    0    0    135M 58K  0    0    0    0    7K   135M
  0    0    0    0    0    0    0    0    137M 58K  0    0    0    0    8K   137M
  0    0    0    0    0    0    0    0    136M 58K  0    0    0    0    7K   136M
  0    0    0    0    0    0    0    0    137M 58K  0    0    0    0    8K   137M
  0    0    0    0    0    0    0    0    136M 58K  0    0    0    0    8K   136M
  0    0    0    0    0    0    0    0    136M 58K  0    0    0    0    7K   136M
```

Show Setup Command

Displays the current SNMP and system settings.

Authority User

Syntax **show setup**
mfg
snmp
system

Keywords **mfg**
Displays manufacturing information about the switch.

snmp
Displays the current SNMP settings.

system
Displays the current system settings.

Examples The following is an example of the Show Setup Mfg command:

```
SANbox2 #> show setup mfg
Manufacturing Information
  -------------------------
  BoardSerialNumber      000781428
  BrandName              QLogic
  BuildDate              Unknown
  ChassisPartNumber      Unknown
  ChassisSerialNumber    S01450034
  MACAddress             00:c0:dd:00:bc:09
  PlanarPartNumber       Unknown
  SwitchSymbolicName     SANbox2
  SwitchWWN              10:00:00:c0:dd:00:bc:08
  SystemDescription      QLogic SANbox2 FC Switch
  SystemObjectID         1.3.6.1.4.1.1663.1.1.1.1.11
```

The following is an example of the Show Setup Snmp command:

```
SANbox2 #> show setup snmp
  SNMP Information
  ----------------
  Contact               <sysContact undefined>
  Location              N_107 System Test Lab
  Description           QLogic SANbox2 FC Switch
  Trap1Address          10.0.0.254
  Trap1Port             162
  Trap1Severity         warning
  Trap1Enabled          False
  Trap2Address          0.0.0.0
  Trap2Port             162
  Trap2Severity         warning
  Trap2Enabled          False
  Trap3Address          0.0.0.0
  Trap3Port             162
  Trap3Severity         warning
  Trap3Enabled          False
  Trap4Address          0.0.0.0
  Trap4Port             162
  Trap4Severity         warning
  Trap4Enabled          False
  Trap5Address          0.0.0.0
  Trap5Port             162
  Trap5Severity         warning
  Trap5Enabled          False
  ObjectID              1.3.6.1.4.1.1663.1.1.1.1.11
  AuthFailureTrap       True
```

The following is an example of the Show Setup System command:

```
SANbox2 #> show setup system

  System Information
  ------------------
  Eth0NetworkAddress         10.0.0.1
  Eth0NetworkMask            255.255.255.0
  Eth0GatewayAddress         10.0.0.254
  Eth0NetworkDiscovery       Static
  AdminTimeout               30
  SecurityEnabled            False
  LocalLogEnabled            True
  RemoteLogEnabled           False
  RemoteLogHostAddress       10.0.0.254
```

Shutdown Command

Terminates all data transfers on the switch at convenient points and closes the Telnet session. Always power cycle the switch after entering this command.

Authority Admin

Syntax **shutdown**

Notes Always use this command to effect an orderly shut down before removing power from the switch. Failure to do so could corrupt the flash memory and the switch configuration.

Test Command

Tests ports using internal (SerDes level), external (SFP), and online loopback tests. Internal and external tests require that the port be placed in diagnostic mode. Refer to the "Set Command" on page A-23 for information about changing the port administrative state. While the test is running, the remaining ports on the switch remain fully operational.

Authority Admin

Syntax

test
port [port_number] [test_type]
cancel
status

Keywords

port [port_number] *[test_type]*
Tests the port given by [port_number] using the test given by [test_type]. If you omit [test_type], Internal is used. [test_type] can have the following values:

internal
Tests the SerDes. This is the default. The port must be in diagnostics mode to perform this test.

external
Tests both the SerDes and SFP. The port must be in diagnostics mode to perform this test, and a loopback plug must be installed in the SFP.

online
Tests one online port.

cancel
Cancels the online test in progress.

status
Displays the status of a test in progress, or if there is no test in progress, the status of the test that was executed last.

Examples To run an internal (SerDes) or external (SFP) port tests, do the following:

1. To start an admin session, enter the following command and press the Enter key.

   ```
   admin start
   ```

2. Place the port in Diagnostics mode, enter the following command (*x* = port number) and press the Enter key.

   ```
   set port x state diagnostics
   ```

3. Insert the loopback plug into the SFP on the selected port.

4. Choose type of port loopback test to run:

   - To run an internal loopback test, enter the following:

     ```
     test x internal
     ```

- To run an external loopback test, enter the following:

  ```
  test x external
  ```

5. A series of test parameters are displayed on the screen. Press the Enter key to accept each default parameter value, or type a new value for each parameter and press the Enter key. The TestLength parameter is the number of frames sent, the FrameSize (256 byte maximum in some cases) parameter is the number of bytes in each frame, and the DataPattern parameter is the pattern in the payload.
6. After the test type has been chosen and the command executed, a message on the screen will appear detailing the test results.
7. After the test is run, put the port back into online state by entering the following command (*x* = port number) and pressing the Enter key.

   ```
   set port x state online
   ```

8. To verify port is back online, enter the following command and press the Enter key. The contents of the AdminState field should display be “Online”.

   ```
   show port x
   ```

The online loopback (node-to-node) test can test only one port at a time, and that port must be online and connected to a remote device. To run the online loopback test, do the following:

1. To start an admin session, enter the following command and press the Enter key.

   ```
   admin start
   ```

2. To run the online loopback test, enter the following command and press the Enter key.

   ```
   test x online
   ```

3. A series of test parameters are displayed on the screen. Press the Enter key to accept each default parameter value, or type a new value for each parameter and press the Enter key. The TestLength parameter is the number of frames sent, the FrameSize (256 byte maximum in some cases) parameter is the number of bytes in each frame, and the DataPattern parameter is the pattern in the payload. Before running the test, make sure that the device attached to the port can handle the test parameters.

   ```
   SANbox2N107 (admin) #> test x online

   A list of attributes with formatting and current values will
   follow. Enter a new value or simply press the ENTER key to
   accept the default value. If you wish to terminate this
   ```

```
process before reaching the end of the list press 'q' or 'Q'
and the ENTER key to do so.

  TestLength    (decimal value, 1-4294967295)   [100    ]
  FrameSize     (decimal value, 36-2148)        [256    ]
  DataPattern   (32-bit hex value or 'Default') [Default]
  StopOnError   (True/False)                    [False  ]
  Do you want to start the test? (y/n) [n]
```

4. After all parameter values are defined, press the Y key to start the test.

Uptime Command

Displays the elapsed time since the switch was last reset and reset method.

Authority User

Syntax **uptime**

Examples The following is an example of the Uptime command:

```
SANbox2 #> uptime

  Elapsed up time  : 0 day(s), 2 hour(s), 28 min(s), 44 sec(s)
  Reason last reset: NormalReset
```

User Command

Administers or displays user accounts.

Authority Admin. The List keyword is available with User authority.

Syntax **user**

accounts
add
delete [account_name]
list

Keywords **accounts**

Displays all user accounts that exist on the switch.

add

Add a user account to the switch. After this command is executed, the administrator will be prompted for the information needed to establish the user account. A switch can have a maximum of 15 user accounts. Account names are limited to 15 characters; passwords are limited to 31 characters.

delete [account_name]

Deletes the account name given by [account_name] from the switch.

list

Displays the list of users currently logged in and their session numbers. Provides the same function as the Show Users command. This keyword is valid for User authority and does not require an admin session.

Examples The following is an example of the User Accounts command:

```
SANbox2  (admin) #> user accounts

  Current list of user accounts
  -----------------------------
  admin        (admin authority = True)
  user1        (admin authority = False)
  user2        (admin authority = False)
  user3        (admin authority = True)
```

The following is an example of the User Add command:

```
SANbox2  (admin) #> user add

      Press 'q' and the ENTER key to abort this command.

  account name (1-15 chars)      : user3
  account password (4-20 chars)  :

  please confirm account password:

  should this account have admin authority? (y/n) [n] : y

  OK to add user account 'user3' with admin authority?
  Please confirm (y/n): [n] y
```

The following is an example of the User Delete command:

```
SANbox2  (admin) #> user del user3

  The user account will be deleted.  Please confirm (y/n): [n] y
```

The following is an example of the User List command:

```
SANbox2  (admin) #> user list

  Current list of users logged in
  -------------------------------
  admin@OB-session1 - in admin mode
  admin@OB-session2
  user1@OB-session3
```

Whoami Command

Displays the account name, session number, and switch domain ID for the Telnet session.

Authority User

Syntax **whoami**

Examples The following is an example of the Whoami command:

```
SANbox2 #> whoami

User name:admin@session2
Switch name:SANbox2
Switch domain ID:1
```

Zone Command

Manages zones and zone membership on a switch. The Zone command defines members (ports and devices) for a single switch. Zones are members of zone sets.

Authority Admin authority and a Zoning Edit session. Refer to the Zoning Command on page A-79 for information about starting a Zoning Edit session. The List, Members, and Zonesets keywords are available with User authority and do not require a Zoning Edit session.

Syntax

zone
add [zone] [members]
copy [zone_source] [zone_destination]
create [zone]
delete [zone]
list
members [zone]
remove [zone] [members]
rename [zone_old [zone_new]
type [zone] *[zone_type]*
zonesets [zone]

Keywords

add [zone] [members]
Specifies one or more ports given by [members] to add to the zone named [zone]. A zone can have a maximum of 256 members. [members] can have one of the following formats:

- Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.
- 6-character hexadecimal device Fibre Channel address (hex)
- 16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.
- Alias name

The application verifies that the [zone] format is correct, but does not validate that such a port exists.

copy [zone_source] [zone_destination]
Creates a new zone named [zone_destination] and copies the membership into it from the zone given by [zone_source].

create [zone]
Creates a zone with the name given by [zone]. An zone name must begin with a letter and be no longer than 64 characters. Valid characters are 0-9, A-Z, a-z, &, _, and -. The zoning database supports a maximum of 256 zones.

delete [zone]
Deletes the specified zone given by [zone] from the zoning database. If the zone is a member of the active zone set, the zone will not be removed from the active zone set until the active zone set is deactivated.

list
Displays a list of all zones and the zone sets of which they are members. This keyword is valid for User authority and does not require a zoning edit session.

members [zone]
Displays all members of the zone given by [zone]. This keyword is available with User authority and does not require a Zoning Edit session.

remove [zone] [members]
Removes the ports given by [members] from the zone given by [zone]. [members] can have one of the following formats:

- Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.
- 6-character hexadecimal device Fibre Channel address (hex)
- 16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.
- Alias name

rename [zone_old] [zone_new]
Renames the zone given by [zone_old] to the zone given by [zone_new].

type [zone] *[zone_type]*
Specifies the zone type given by [zone_type] to be assigned to the zone name given by [zone]. If you omit the [zone_type], the system displays the zone type for the zone given by [zone]. [zone_type] can be one of the following:

soft
Name server zone

hardacl
Access control list hard zone

hardvpf
Virtual private fabric hard zone

zonesets [zone]
Displays all zone sets of which the zone given by [zone] is a member. This keyword is available with User authority and does not require a Zoning Edit session.

Examples

The following is an example of the Zone List command:

```
SANbox2 #> zone list

  Zone        ZoneSet
  -------------------
  wwn_b0241f
              zone_set_1

  wwn_23bd31
              zone_set_1

  wwn_221416
              zone_set_1

  wwn_2215c3
              zone_set_1

  wwn_0160ed
              zone_set_1

  wwn_c001b0
              zone_set_1

  wwn_401248
              zone_set_1

  wwn_02402f
              zone_set_1

  wwn_22412f
              zone_set_1
```

The following is an example of the Zone Members command:

```
SANbox2 #> zone members wwn_b0241f

  Current List of Members for Zone: wwn_b0241f
  --------------------------------
  50:06:04:82:bf:d2:18:c2
  50:06:04:82:bf:d2:18:d2
  21:00:00:e0:8b:02:41:2f
```

The following is an example of the Zone Zonesets command:

```
SANbox2 #> zone zonesets zone1

  Current List of ZoneSets for Zone: wwn_b0241f
  ---------------------------------
  zone_set_1
```

Zoneset Command

Manages zone sets and zone set membership across the fabric.

Authority

Admin authority and a Zoning Edit session. Refer to the Zoning Command on page A-79 for information about starting a Zoning Edit session. The Active, List, and Zones keywords are available with User authority. You must close the Zoning Edit session before using the Activate and Deactivate keywords.

Syntax

zoneset
activate [zone_set]
active
add [zone_set] [zone_list]
copy [zone_set_source] [zone_set_destination]
create [zone_set]
deactivate
delete [zone_set]
list
remove [zone_set] [zone_list]
rename [zone_set_old] [zone_set_new]
zones [zone_set]

Keywords

activate [zone_set]
Activates the zone set given by [zone_set]. This keyword deactivates the active zone set. Close the Zoning Edit session before using this keyword.

active
Displays the name of the active zone set. This keyword is available with User authority and does not require a Zoning Edit session.

add [zone_set] [zone_list]
Adds a list of zones and aliases given by [zone_list] to the zone set given by [zone_set]. Zone and alias names are delimited by spaces in [zone_list]. This keyword requires a Zoning Edit session.

copy [zone_set_source] [zone_set_destination]
Creates a new zone set named [zone_set_destination] and copies into it the membership from the zone set given by [zone_set_source]. This keyword requires a Zoning Edit session.

create [zone_set]
Creates the zone set with the name given by [zone_set]. A zone set name must begin with a letter and be no longer than 64 characters. Valid characters are 0-9, A-Z, a-z, &, _, and -. This keyword requires a Zoning Edit session. The zoning database supports a maximum of 256 zone sets.

deactivate
Deactivates the active zone set. Close the Zoning Edit session before using this keyword.

delete [zone_set]
Deletes the zone set given by [zone_set]. If the specified zone set is active, the command is suspended until the zone set is deactivated. This keyword requires a Zoning Edit session.

list
Displays a list of all zone sets. This keyword is available with User authority and does not require a Zoning Edit session.

remove [zone_set] [zone_list]
Removes a list of zones and aliases given by [zone_list] from the zone set given by [zone_set]. Zone and alias names are delimited by spaces in [zone_list]. If [zone_set] is the active zone set, the zone will not be removed until the zone set has been deactivated. This keyword requires a Zoning Edit session.

rename [zone_set_old] [zone_set_new]
Renames the zone set given by [zone_set_old] to the name given by [zone_set_new]. You can rename the active zone set. This keyword requires a Zoning Edit session.

zones [zone_set]
Displays all zones that are members of the zone set given by [zone_set]. This keyword is available with User authority and does not need a Zoning Edit session.

Notes

- A zone set must be active for its definitions to be applied to the fabric.
- Only one zone set can be active at one time.
- A zone can be a member of more than one zone set.

Examples

The following is an example of the Zoneset Active command:

```
SANbox2 #> zoneset active

  The active ZoneSet is:  Beta
```

The following is an example of the Zoneset List command:

```
SANbox2 #> zoneset list

  Current List of ZoneSets
  ------------------------
  alpha
  beta
```

The following is an example of the Zoneset Zones command:

```
SANbox2 #> zoneset zones ssss

  Current List of Zones for ZoneSet: ssss
  ---------------------------------
  zone1
  zone2
  zone3
```

Zoning Command

Opens a Zoning Edit session in which to create and manage zone sets and zones. Refer to the Zone Command on page A-72 and the Zoneset Command on page A-76.

Authority Admin. The List keyword is available with User authority.

Syntax

zoning
- active
- cancel
- clear
- edit
- history
- limits
- list
- restore
- save

Keywords

active
Displays membership information for the active zone set including member zones and zone members.

cancel
Closes the current Zoning Edit session. Any unsaved changes are lost.

clear

Clears all inactive zone sets from the volatile edit copy of the zoning database. This keyword does not affect the non-volatile zoning database. However, if you enter the Zoning Clear command followed by the Zoning Save command, the non-volatile zoning database will be cleared from the switch. The preferred method for clearing the zoning database from the switch is the Reset Zoning command.

edit
Opens a Zoning Edit session.

history
Displays a history of zoning modifications including the following:

- Time of the most recent zone set activation or deactivation and the user who performed it
- Time of the most recent modifications to the zoning database and the user who made them.
- Checksum for the zoning database

limits
Displays the maximum limits imposed on the zoning database for the number of zone sets, zones, aliases, members per zone, members per alias, and total members.

list
Lists all fabric zoning definitions. This keyword is available with User authority.

restore
Reverts the changes to the zoning database that have been made during the current Zoning Edit session since the last Zoning Save command was entered.

save
Saves changes made during the current Zoning Edit session. The system will inform you that the zone set must be activated to implement any changes. This does not apply if you entered the Zoning Clear command during the Zoning Edit session.

Examples

The following is an example of the Zoning Edit command:

```
SANbox2 #> admin start

SANbox2  (admin) #> zoning edit

SANbox2  (admin-zoning) #>
.
.
SANbox2  (admin-zoning) #> zoning cancel

  Zoning edit mode will be canceled.  Please confirm (y/n): [n]   y
SANbox2  (admin) #> admin end
```

The following is an example of the Zoning List command:

```
SANbox2 #> zoning list

  Active ZoneSet Information

  ZoneSet     Zone      ZoneMember
  --------------------------------
  wwn
              wwn_b0241f
                        50:06:04:82:bf:d2:18:c2
                        50:06:04:82:bf:d2:18:d2
                        21:00:00:e0:8b:02:41:2f

              wwn_23bd31
                        50:06:04:82:bf:d2:18:c2
                        50:06:04:82:bf:d2:18:d2
                        10:00:00:00:c9:23:bd:31

              wwn_221416
```

```
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    10:00:00:00:c9:22:14:16

          wwn_2215c3
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    10:00:00:00:c9:22:15:c3

Configured Zoning Information

ZoneSet     Zone      ZoneMember
--------------------------------
wwn
          wwn_b0241f
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    21:00:00:e0:8b:02:41:2f

          wwn_23bd31
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    10:00:00:00:c9:23:bd:31

          wwn_221416
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    10:00:00:00:c9:22:14:16

          wwn_2215c3
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    10:00:00:00:c9:22:15:c3
```

Notes

Appendix B
Graphing Port Performance

SANsurfer Fabric View is an optional application that displays port performance using graphs. SANsurfer Fabric View plots data communication rates and total errors for selected ports as shown in Figure B-1. When graphing data communication rates, you can choose either frames/second or KB/second.

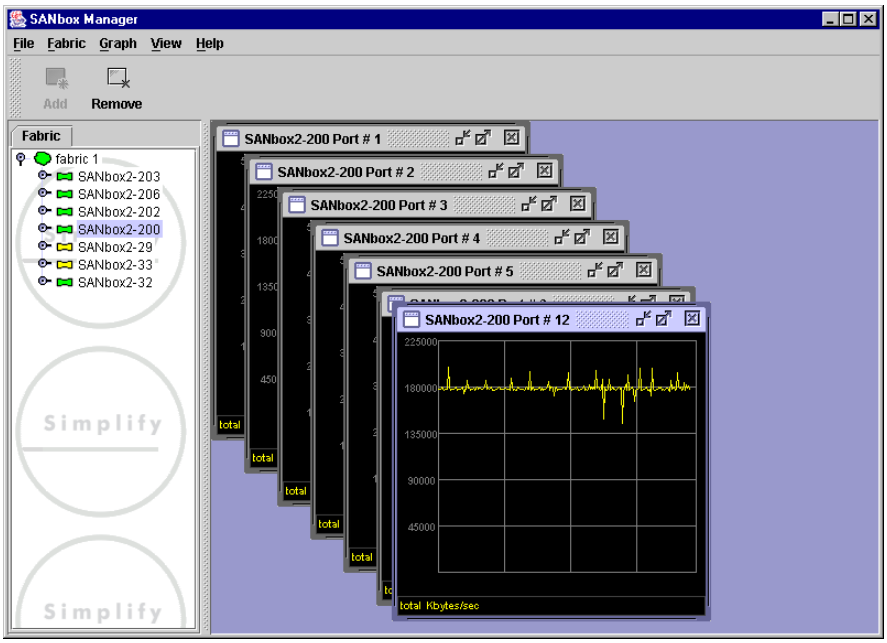


Figure B-1. Fabric View Graphs

This appendix describes how to do the following:

- Start SANsurfer Fabric View
- Display graphs
- Arrange graphs in the display
- Customize graphs

B.1 Starting SANsurfer Fabric View

To start SANsurfer Fabric View from within SANbox Manager, open the faceplate display and select **Start Fabric View** from the Switch menu.

B.2 Displaying Graphs

To display graphs, do the following:

1. Open the Fabric menu and select **Add Fabric** or click the **Add** button. Enter a fabric name and an IP address in the Add a New Fabric window. Include a login name and a password if required.
2. Set the graphing options and polling frequency. By default, SANsurfer Fabric View plots total bytes transmitted and received at a polling frequency of once per second. Refer to "Customizing Graphs" on page B-3 for information about changing what is plotted and how it is plotted.
3. Select a switch icon in the Fabric Tree to display a graph for each logged-in port on that switch; or display a graph for a single port by clicking on the switch entry handle and selecting one or more ports.
4. You can move graphs around individually by clicking and dragging, or you can arrange them as a group. Refer to "Arranging Graphs in the Display" on page B-2 for more information. To remove a graph, click the graph **Close** button. To remove all graphs, open the View menu and select **Close All Graphs**.

SANsurfer Fabric View can access only one fabric at a time. To access another fabric, you must first remove the current fabric. To remove a fabric, open the Fabric menu and select **Remove Fabric** or click the **Remove** button.

B.2.1 Arranging Graphs in the Display

To arrange and size graphs in the display, open the View menu and select **Tile Graphs Vertically**, **Tile Graphs Horizontally**, or **Cascade Graph Panels**.

- Tiling vertically sizes and arranges the graphs in the longest columns possible.
- Tiling horizontally sizes and arranges the graphs in the longest rows possible.
- Cascading overlaps the graphs so that all graphs are at least partially visible.

B.2.2
Customizing Graphs

You can customize the graph polling frequency, what is plotted in the graphs, and the graph color scheme. To set the polling frequency for all graphs, open the Graph menu and select **Set Polling Frequency...**. Enter an interval in seconds (0–60) in the dialog box and choose the **OK** button.

To choose what is to be plotted, open the Graph menu and select **Options...**. This opens the Modify Graph Display shown in Figure B-2.

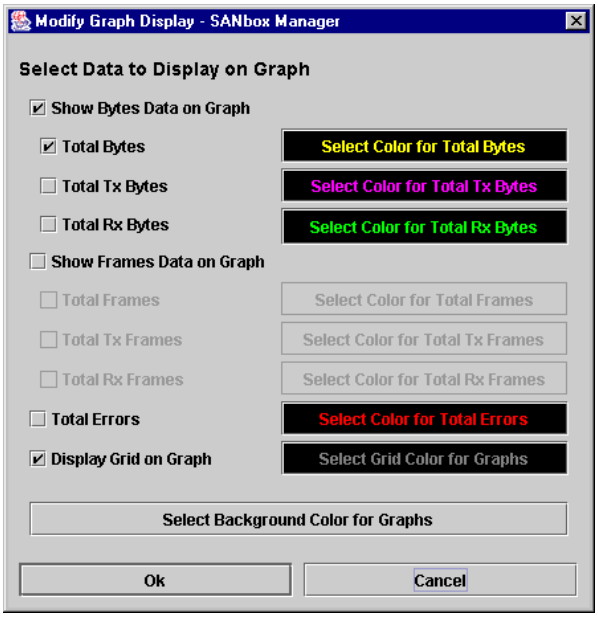

Modify Graph Display - SANbox Manager
Select Data to Display on Graph
Show Bytes Data on Graph
Total Bytes
Select Color for Total Bytes
Total Tx Bytes
Select Color for Total Tx Bytes
Total Rx Bytes
Select Color for Total Rx Bytes
Show Frames Data on Graph
Total Frames
Select Color for Total Frames
Total Tx Frames
Select Color for Total Tx Frames
Total Rx Frames
Select Color for Total Rx Frames
Total Errors
Select Color for Total Errors
Display Grid on Graph
Select Grid Color for Graphs
Select Background Color for Graphs
Ok
Cancel

Figure B-2. Modify Graph Display

To modify the graph display, do the following:

1. Choose the units for the graph:
   - Select the **Show Bytes Data on Graph** check box to plot data in KBytes/second
   - Select the **Show Frames Data on Graph** check box to plot data in frames/second.

2. Choose what data type to plot. For example, if you selected **Show Frames Data on Graph** in step 1, you can plot one or all of the following:
   - Total frames transmitted and received (**Total Frames**)
   - Total frames transmitted (**Total Tx Frames**)
   - Total frames received (**Total Rx Frames**)

   In addition to these, you can also plot total errors by selecting the **Total Errors** check box.
3. Display or hide the unit grid. Select the **Display Grid on Graph** check box to display the unit grid.
4. Choose the color scheme for the graph. You can select the color for each data type, the unit grid, and the background by clicking the corresponding color field or button. In each case, you can choose a color using the swatches, Red-Green-Blue (RGB), or Hue-Saturation-Brightness (HSB) method.
   - Swatches – Click the **Swatches** tab. Select a swatch from the palette and choose the **OK** button.
   - HSB – Click the **HSB** tab. Select a color using any of the following methods and choose the **OK** button:
     - Click in the color palette.
     - Select the **H**, **S**, or **B** button and use the slide to vary the selected value.
     - Enter values in the H, S, or B input fields.
   - RGB – Click the **RGB** tab. Select a color by moving the slides to adjust the values for red, blue, and green; or enter values in the input fields. Choose the **OK** button.

Glossary

Activity LED

A port LED that indicates when frames are entering or leaving the port.

Alias

A collection of objects that can be zoned together. An alias is not a zone, and can not have a zone or another alias as a member.

ALFairness

On an arbitrated loop, the switch is always highest priority when arbitrating for the right to transfer. To prevent other devices from being locked out, the standard provides for a fairness mode, which if enabled requires an arbitrater to let all other devices win arbitration before arbing a second time. (True / False).

AL_PA

Arbitrated Loop Physical Address

Arbitrated Loop

A Fibre Channel topology where ports use arbitration to establish a point-to-point circuit.

Arbitrated Loop Physical Address (AL_PA)

A unique one-byte valid value assigned during loop initialization to each NL_Port on a Loop.

ARB_FF

When ARB_FF is enabled, it causes the switch to send the ARB_FF primitive when it is in monitoring mode, rather than idles. The only reason to do this is since the ARB_FF has less bit transitions than does an idle, it produces less EMI. It has no other effect. (True / False)

ASIC

Application Specific Integrated Circuit

BootP

A type of network server.

Buffer Credit

A measure of port buffer capacity equal to one frame.

Class 2 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports with acknowledgment provided.

Class 3 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports without acknowledgment.

Domain ID

User defined name that identifies the switch in the fabric.

E_Port

Expansion port. A switch port that connects to another FC-SW-2 compliant switch.

Expansion Port

See E_Port.

ExtCredit

Allows full speed operation over distances greater than 10 kilometers. Additional credit buffers are borrowed from other ports (which must be set to donor state). Decimal value 0-65535

Fabric Management Switch

The switch through which the fabric is managed.

Fabric Name

User defined name associated with the file that contains user list data for the fabric.

Fan Fail LED

An LED that indicates that a cooling fan in the switch is operating below standard.

FC-PLDA

Fibre Channel Private Loop Direct Attach

Flash Memory

Memory on the switch that contains the chassis control firmware.

Frame

Data unit consisting of a start-of-frame (SOF) delimiter, header, data payload, CRC, and an end-of-frame (EOF) delimiter.

FRU

Field Replaceable Unit

Heartbeat LED

A chassis LED that indicates the status of the internal switch processor and the results of the Power-On Self-Test.

Initiator

The device that initiates a data exchange with a target device.

In-Order-Delivery

A feature that requires that frames be received in the same order in which they were sent.

Input Power LED

A chassis LED that indicates that the switch logic circuitry is receiving proper DC voltages.

InteropCredit

This variable determines the number of credits we will advertise on an ISL. Non-FC-SW2 compliant switches required that we match their offering (decimal value, 0-255).

IP

Internet Protocol

ISLSecurity

ISLSecurity determines which switches a port will establish a link with. ANY - we will link with any switch. Ours - we will only link to another QLogic switch. None - the port will not establish an ISL link.

LCFEnable

LCFEable gives preference to Link control frames (such as class 2 ACK frames) over other frames, when queued for transmission in the switch. This may provide better performance when running Class 2 traffic. LCFEable is incompatible with MFSEnable, and both cannot be selected. (True / False)

LIP

Loop Initialization Primitive sequence

Logged-In LED

A port LED that indicates device login or loop initialization status.

Management Information Base

A set of guidelines and definitions for the Fibre Channel functions.

Management Workstation

PC workstation that manages the fabric through the fabric management switch.

MIB

Management Information Base

MSEnable

Determines whether GS-3 management server commands will be accepted on the port. It can be used to prevent inband management of the switch on any or all ports. (True / False)

NL_Port

Node Loop Port. A Fibre Channel device port that supports arbitrated loop protocol.

N_Port

Node Port. A Fibre Channel device port in a point-to-point or fabric connection.

NoClose

Causes the switch to keep the loop open, if no other device is arbitrating. It is intended to improve performance when there is a single L_Port device connected to the switch. (True / False)

Output Power LED

A power supply LED that indicates that the power supply is providing DC voltage to the switch.

Over Temperature LED

A chassis LED or a power supply LED that indicates that the switch or power supply is overheating.

POST

Power On Self Test

Power On Self Test (POST)

Diagnostics that the switch chassis performs at start up.

Private Device

A device that can communicate only with other devices on the same loop.

Private Loop

A loop of private devices connected to a single switch port.

SANbox Manager

Switch management application.

SFF

Small Form-Factor transceiver.

SFP

Small Form-Factor Pluggable. A transceiver device, smaller than a GigaBit Interface Converter, that plugs into the Fibre Channel port.

Small Form Factor

A transceiver device, smaller than a GigaBit Interface Converter, that is permanently attached to the circuit board.

Small Form-Factor Pluggable

A transceiver device, smaller than a GigaBit Interface Converter, that plugs into the Fibre Channel port.

SNMP

Simple Network Management Protocol

Target

A storage device that responds to an initiator device.

VCCI

Voluntary Control Council for Interference

VIEnable

FC-VI. When enabled, VI preference frames will be transmitted ahead of other frames. (True / False)

Worldwide Name (WWN)

A unique 64-bit address assigned to a device by the device manufacturer.

WWN

Worldwide Name

Zone

A set of ports or devices grouped together to control the exchange of information.

Zone Set

A set of zones grouped together. The active zone set defines the zoning for a fabric.

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